Chemical Week

February 25, 1956





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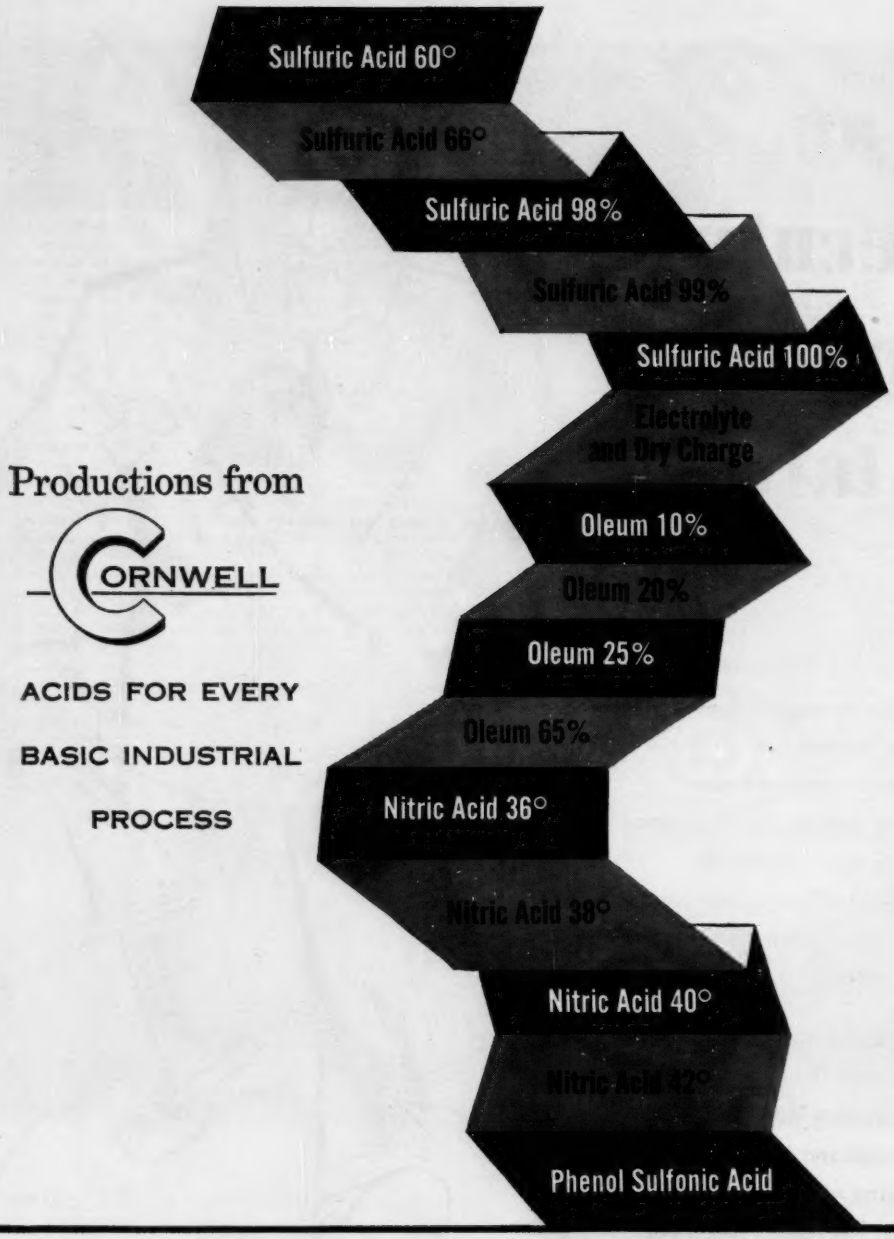
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Chemical Week

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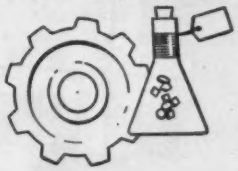
Kellogg's going into polyethylene to balance ups and downs of engineering operations

104 Ion exchange bolsters nuclear stockpile with uranium from low-grade ores

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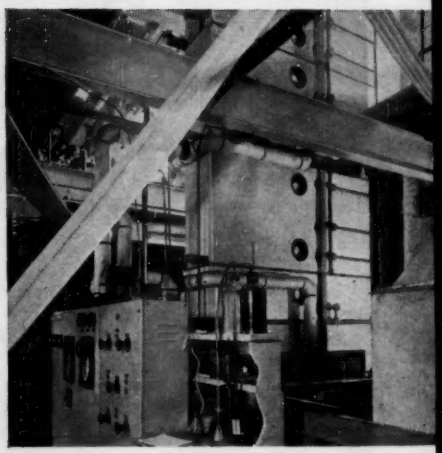
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Becco Peroxygen Chemicals are widely used under Becco patented processes, freely licensed, in the manufacture and processing of textiles, pulp and paper, synthetic organic chemicals, foods and plastics, to name but a few examples.

Of particular current interest are Becco *epoxidation* processes. One process produces epoxidized compounds of extremely low iodine number. Another is a catalyzed *in situ* process giving high yields at low cost and low investment. It offers a choice of catalysts, among them ion exchange resins. So little catalyst may be used that it can be discarded economically after each run.

These flexible, fully proved processes are covered by pending and issued patents, available under license agreements to manufacturers. They are of particular interest in the manufacture of resins, plasticizers and stabilizers, paints, varnishes, lubricants and organic chemicals.

Send for a copy of the Becco Bulletin List. Titles indicate the broad scope of Becco's ability to offer assistance in specific fields.

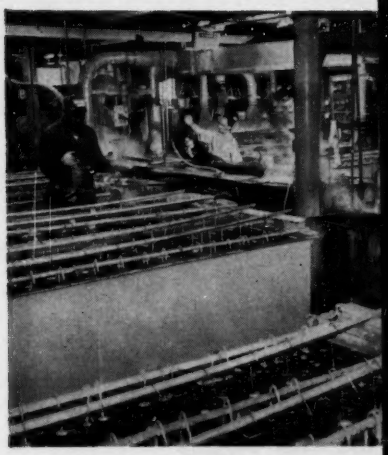


Heart of modern bleaching ranges for whites or for goods to be dyed is the Becco J-box. The system is simple both mechanically and chemically, yet amazingly efficient. Becco Hydrogen Peroxide is the bleaching agent. Until recently, all modern bleach formulas required the incorporation of silicates which tend to encrust the J-box and require frequent box cleaning to avoid abrasion damage to the fabric. Becco has recently announced a revolutionary process using silicate-free formulas. Licenses are being issued to textile manufacturers for the use of the process.

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Known as "Vultures" in the trade, these feathers of the rhea or South American ostrich are being whirled on a drum and lightly beaten by overhead leather straps in a drying-room. Previously, they have been washed, degreased and bleached with Hydrogen Peroxide. Feathers from many parts of the world are used by the feather industry to make fans, dusters, Badminton birds, negligees, theatrical costumes and other commodities.



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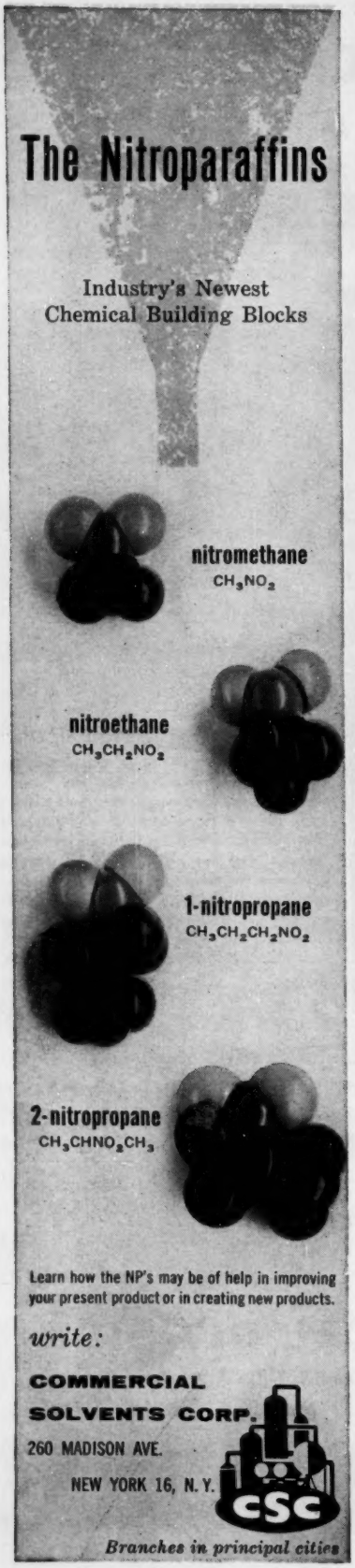
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OPINION . . . . .

Still Significant

TO THE EDITOR: Your recent summary of an Air Force publication on fungicides (*Jan. 7*) states that the report "significantly omits copper compounds."

This statement might easily be misinterpreted. The Air Force report dealt exclusively with *experimental antibiotic* and *fluorinated* chemicals, and a report of this nature would hardly include any copper compounds.

As to the value of at least one copper compound, the report reveals that copper-8-quinolinolate was selected as the control fungicide, thus giving it recognition as the standard against which the candidate fungicides should be tested.

RALPH EISENSCHIML
Vice-President
Cunilate Division
Scientific Oil Compounding Co., Inc.
Chicago.

We used the word "significantly" simply to point up the fact that the Air Force is looking beyond copper compounds, effective though they may be.—ED.

News, Not History

TO THE EDITOR: We have noted your recent references to the new phenoxybutyric selective weed killers, 2,4-D-B and M.C.P.B. (*Jan. 14; Jan. 21*).

We are a little hurt to see that no credit is given to Prof. R. L. Wain, of Wye College, London University, who was responsible for all the original development of these, in what must be regarded as one of the classics of research.

The first public release was made at the 2nd British Weed Control Conference held at Harrogate in 1954. These weed killers are now in use in Great Britain for the second spraying season, and we think that in fairness you should give credit where it is due, instead of insinuating that these new tools of husbandry are emanating from the American Chemical Paint Co. and Dow.

N. G. SHANE
Agricultural Chemical Division
Metallurgical Chemists Ltd.
London, England

We did not purposely slight Professor Wain's excellent research. But ours was a news story—not a historical review; and we were concerned exclusively here with U. S. developments.—ED.

Closer to Customers

TO THE EDITOR: . . . you might wish to note that the packaging laboratory described in [your] story (*Jan. 14*) is not located at Shawinigan Falls, Que., but rather in Montreal.

The Du Pont of Canada plant for the manufacture of cellophane cellulose film and polythene film, two of the transparent films that undergo tests in the laboratory, is located in Shawinigan Falls. While normal control and development work is carried on at this plant, the packaging laboratory itself has been established closer to customers whom it services.

M. M. LEVENSON
Public Relations Dept.
Du Pont Co. of Canada Ltd.
Montreal, Canada

Priority Protest

TO THE EDITOR: In regard to your article, "New Twist on VCI" . . . (*Oct. 29, '55*), I find no mention of my work.

I believe I was the first to suggest the use of an amine for the protection of a metallic surface. This use was proposed in my letter, dated Aug. '48, to the then chief design engineer at the then Consolidated Vultee A. C. (San Diego, Calif.). It was also described in my CVAC Report No. ZM-117-021, Feb. 1949, "Protection of the Seaplane XP5Y-1 Wings against Corrosion" (a Navy-sponsored project), and also in other CVAC Reports describing the results of experiments.

HERBERT J. BRENNEN
Malibu, Calif.

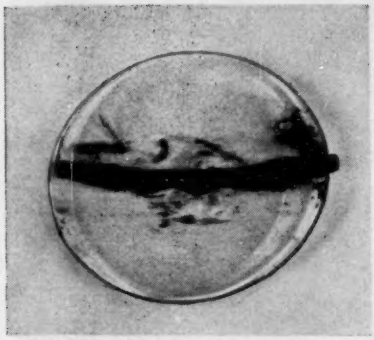
This, again, was simply a news story of a new development—not a historical review of amine anticorrosion agents.—ED.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

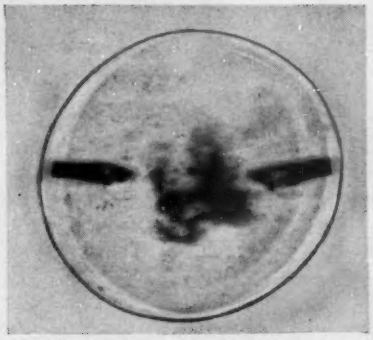
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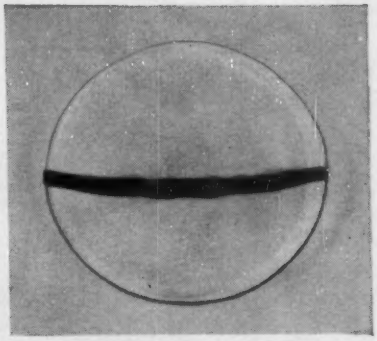
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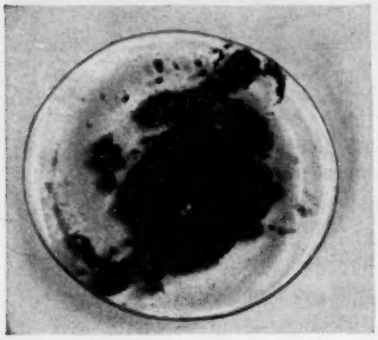
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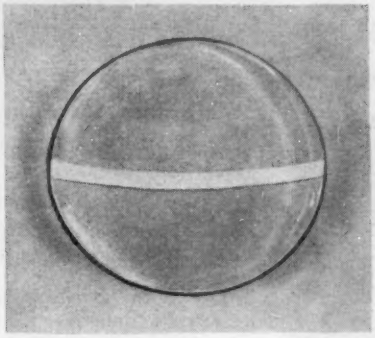
NATURAL RUBBER—10 min. immersion in RFNA



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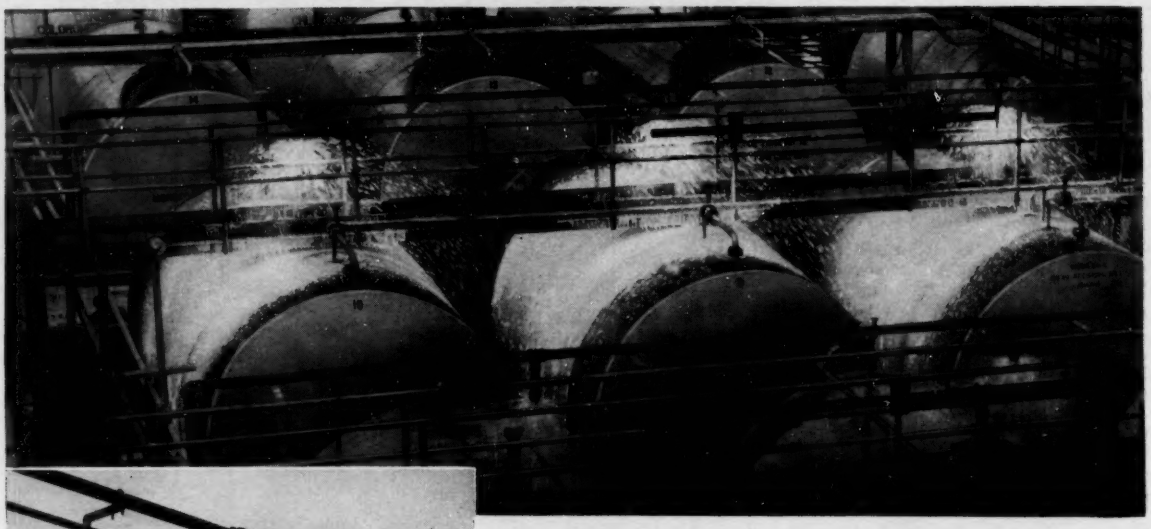
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- **Carbon dioxide blanket** — C-O-Two systems
- **Dry chemical systems**

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There's a good chance a Du Pont specialty surface active agent can help you no matter what you're working on currently. That may sound like a sweeping statement, but frankly, we're amazed at the ways chemists and manufacturers use these materials. Nothing could surprise us now.

For all we know, you might be involved in one of the operations listed below, where Du Pont surface active agents are working—and working rather well, we might add.

If you're interested in emulsion polymerization: You might be working with paints or plastics, in which case you should know we have a surface active agent that in some systems increases rate of polymerization and assists in maintaining uniformity of particle size and distribution.

If static electricity is a problem: An aerosol manufacturer took a tip from the textile industry and now uses one of our surface active agents in his anti-static formulation. Sprayed on a rug, this material forms a conductive coating that continuously drains off electricity and thus prevents it from building up.

If you're concerned with oil production: There are acid-stable Du Pont surface active agents used to promote the wetting action of penetrating acids.

If your business involves metal processing: Reports show one of our surface active agents aids the pickling operation and the foam formed on the surface of the bath reduces the escape of acid fumes.

DID WE MISS YOU?

Quite possibly we did. If you're anything like a plaster manufacturer we know, however, you'll ignore the known uses for these specialty chemicals and go ahead on your own. He picked out one of our surface active agents and made acoustical plaster with amazingly uniform cell structure.

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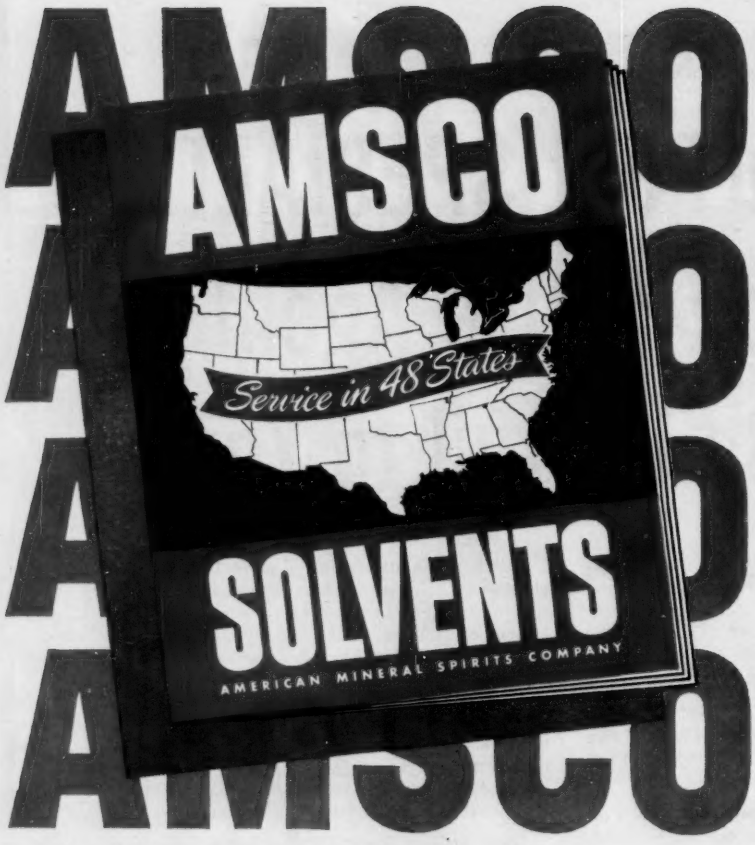
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OPINION . . . . . .

Taking Another Tack

TO THE EDITOR: I was struck by the coincidence of two news stories in your Feb. 11 issue. On page 21 you describe American Viscose's difficulties in breaking into the chemical business via merger and suggest that another route—viz., diversification—would be the firm's choice. Then you report on page 46 that American Viscose retained A. D. Little, Inc., to appraise the usefulness of over 1,000 of its dormant patents. This, it looks to me, was one of the steps taken to diversify into chemicals.

PHILIP JACOBS
Yonkers, N. Y.

Attitude Counts

TO THE EDITOR: Having spent some years in South America as an oil company employee, I was most interested in your Feb. 4 story on dwindling chemical exports from the U. S. to that continent. . . .

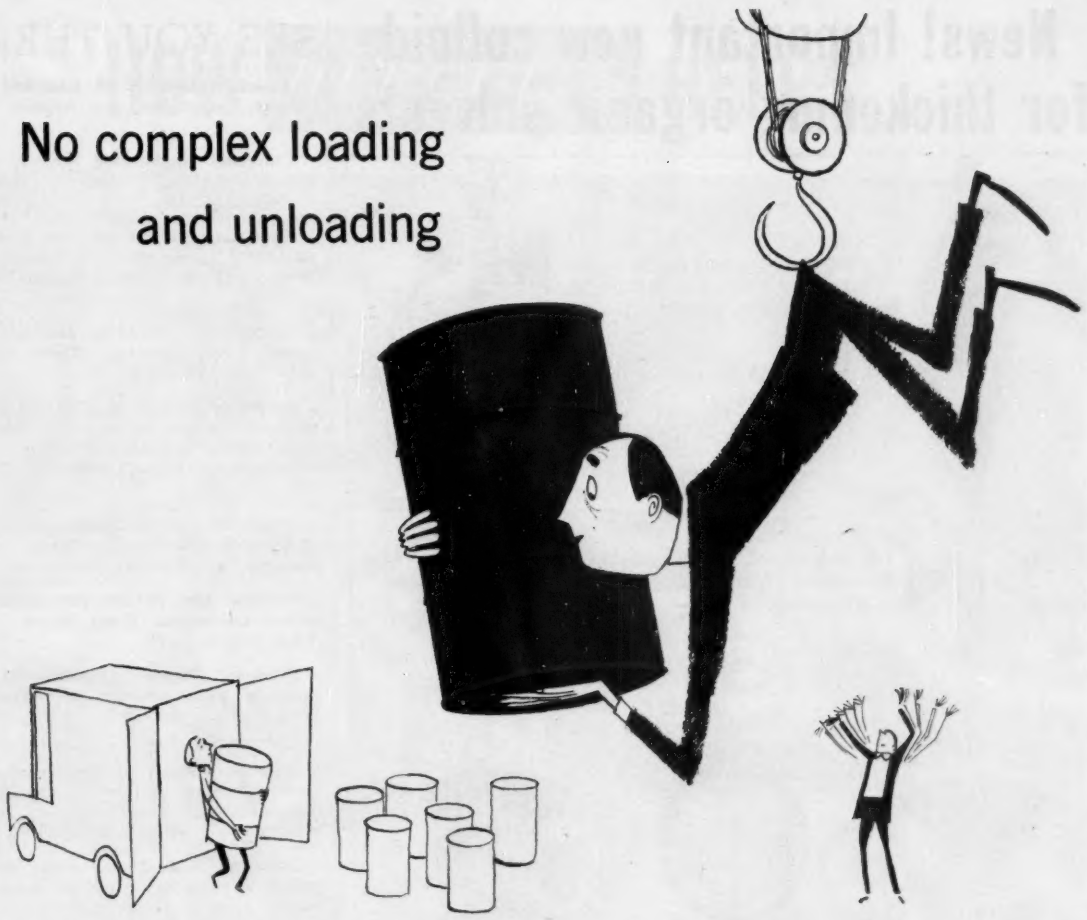
There may be a great many economic factors of which I am not aware, but there are some psychological factors that I am sure have had some deleterious effect—and these factors I can sum up in one word: attitude.

It is my observation that Europeans trying to sell the Latin American market go about it with a great deal more "savvy" than most of their American counterparts. They treat the South American businessman with no trace of condescension; many of them take the trouble to learn to speak Spanish and Portuguese, and they invariably correspond in those languages; if they stay any length of time in a local community, they participate in its life rather than holding themselves aloof; and, most important, they assume good faith on the part of their customers in such matters as credit rather than treating them like no-account thieves. I'm sure I have exaggerated, but there are lessons here for any firm hoping to do an increasing export business with our Latin neighbors. . . .

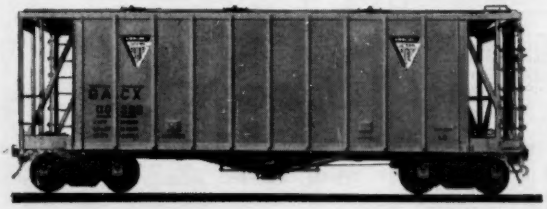
It strikes me that the same lessons might apply in our dealings with Asia, where our competitors are not our Western European allies but the Iron Curtain countries. And here more than trade is at stake: the peace of the world may depend on our attitude towards the Asians.

RALPH M. BROWN
San Francisco

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SEE YOU THERE

American Institute of Chemical Engineers, Statler Hotel, Los Angeles, Feb. 26-29.

Cleveland Engineering Society, 13th annual Machine Design Conference, Cleveland, March 5.

Chemical Institute of Canada, 6th Divisional Conference, Chemical Engr. Division, Guildwood Inn, Sarnia, March 5-7.

Commercial Chemical Development Assn., annual meeting, Statler Hotel, New York, March 8.

American Institute of Electrical Engineers, conference on electrical engineering as applied to paper and pulp industry, University of Florida, Gainesville, March 8-9.

Society of Plastics Industry, 14th annual conference, Sheraton-Brock Hotel, Niagara Falls, Ontario, March 8-9.

National Assn. of Corrosion Engineers, annual convention, Hotel Statler, New York, March 12-16.

Synthetic Organic Chemical Manufacturers' Assn., luncheon, Palm Terrace Suite, Hotel Roosevelt, New York, March 13.

American Society of Mechanical Engineers, aviation conference, sessions on high-temperature rocket engines, Hotel Statler, Los Angeles, March 14-16.

American Water Works Assn., Southeastern meeting, Bon Air Hotel, Augusta, March 18-21; Illinois meeting LaSalle Hotel, Chicago, March 21-23.

American Institute of Mining & Metallurgical Engineers, reactive metals conference, Hotel Statler, Buffalo, March 19-21.

Society of Plastics Industry, 13th annual Pacific Coast Section Conference, St. Francis Hotel, San Francisco, March 27-April 2.

Material Handling Institute Inc., spring meeting, Edgewater Beach Hotel, Chicago, April 3.

American Pharmaceutical Mfg. Assn., annual meeting, Boca Raton Club, Boca Raton, Fla., April 9-11.

Midwest Research Institute, symposium for management on applications of analog computers, Hotel Phillips, Kansas City, Mo., April 10-11.

Metal Powder Assn., 12th annual meeting, Hotel Cleveland, Cleveland, April 10-12.

Council for Agricultural & Chemurgic Research, annual conference, Congress Hotel, Chicago, April 10-12.

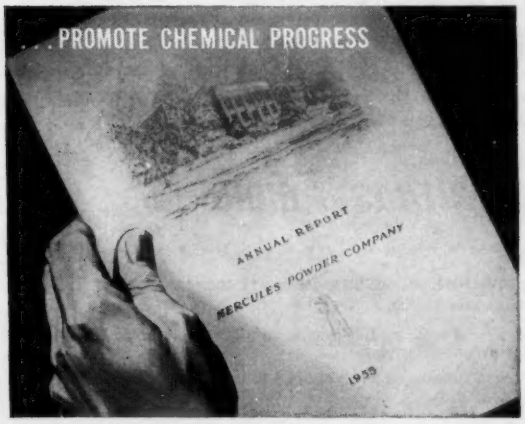
American Oil Chemists' Society, Shamrock Hotel, Houston, April 23-25.

Assn. of Consulting Chemists & Chemical Engineers Inc., symposium and banquet, 5:00 p.m., Hotel Belmont Plaza, New York, April 25.

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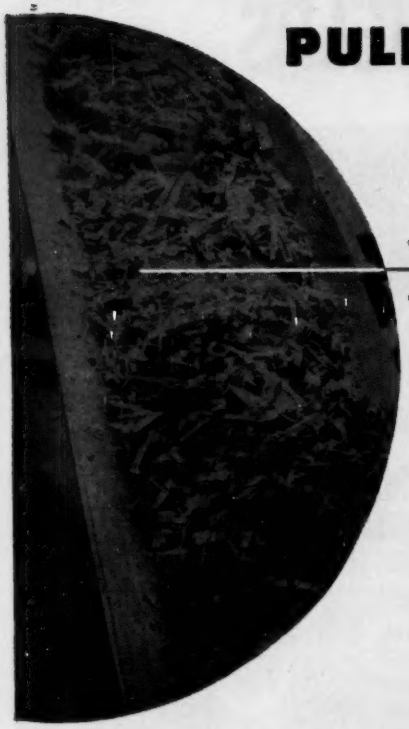
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Business

Newsletter

CHEMICAL WEEK
February 25, 1956

Electromet will have to fight its antitrust suit after all. The U.S. 10th Circuit Court of Appeals, while upholding dismissal by a lower court of criminal antitrust charges against U.S. Vanadium Corp. and Electro Metallurgical Co. of West Virginia, sent back for further proceedings the government's suit against Electro Metallurgical Co. of New York. The government in 1946 filed suit against the three (which now are divisions of Union Carbide), but was rebuffed by U.S. District Judge Lee Knous, who had dismissed the entire suit.

And further fuel has been added to another court case. Though its counter suit has been dismissed in Delaware Chancery Court (*CW, Feb. 18, p. 23*), Reichhold Chemicals will defend itself against Delaware Chemicals' still-pending $1-million pentaerythritol know-how court case by claiming that Delaware did not have an original PE process. Furthermore, Reichhold says it is now using a completely different, self-developed process for making the resin intermediate.

•

Continental Oil, which got into the petroleum sulfonate business when it purchased sulfonation facilities from Stepan Chemical, this week is going further. It has just purchased the capital stock of the Sherwood Refining Co., Englewood, N.J.

Sherwood makes natural sulfonates, white oils and petrolatum from refinery stocks, operates plants at Gretna, La., and Karns City, Pa., and Englewood. Conoco will retain the present Sherwood management.

But another merger, involving International Paper, may not have such easy sledding. International, hoping to merge with Long Bell Lumber Co., which owns some 2 billion board ft. of timber in Oregon, has incurred the wrath of the state's two democratic senators.

Senators Wayne Morse and Richard Neuberger are calling on the Federal Trade Commission, the Department of Justice, the Senate Judiciary Committee and the Senate Small Business Committee for monopoly investigations. A merger would give International—now a "dominant" factor in the pulp and paperboard industry—a substantial toehold on the West Coast, where it has no present pulp or paperboard mills.

But International says that merger talk is premature. It won't reach a decision on the acquisition until April.

•

Du Pont's earnings top the week's flood of financial reports.

In a preliminary estimate, it reports $9.26 earned per share, up 26% from 1954's $7.33. Of this, $2.75 came from its General Motors dividends and $6.51 from its own operations, up 35% and 23%, respectively.

Other reports:

American Cyanamid, with sales up 13% from '54, reports a 43% net profit increase. The '55 dollar figures: $451 million and $39 million respectively.

Merck & Co., with an 8% sales increase (to $158 million), showed a 24% rise in net (to $16 million).

Koppers' earnings statement provided a good prelude to this Tuesday's common stock sales (*see p. 22*). On net sales and income of $230 million, it had a $10.4-million net profit. Sales were up 22%; profit up 70%.

General Tire and Rubber, for the fiscal year ending Nov. 30, had sales of $296 million (up 36%) and profits of $9.7 million, a rise of 116%.

United Carbon showed a 46% jump in sales, to $50 million, reports $5.6-million net, up 35% over the comparable '54 figure.

National Starch Products, with $34 million in net sales (an increase of 12%), posted a $2.1-million net profit, up 17%.

Sun Chemical, with sales of $42 million, had a $2-million net profit. The increases: 5% and 15%, respectively.

Ferro upped its sales 12%, to $49 million, and its net 28%, to $2.5 million.

And Parke, Davis, which saw a substantial boost in sales of its chloramphenicol wide-spectrum antibiotic (Chloromycetin), reports a net of $14 million (up 37%) on sales of $123 million (up 12%).

P&D's $35 million of Chloromycetin sales last year is about equal to a trade estimate of sales of Pfizer's Terramycin, and well above an estimate of $20 million for Lederle's Aureomycin. Add in, however, an estimated $70 million of tetracycline sales by Pfizer and Lederle ($20 million and $50 million, respectively) to put the picture of wide-spectrum antibiotics market in perspective.

•

Industry-wide sales also show new records. The Assn. of American Soap & Glycerine Producers, checking 80 manufacturers, reports 1955 soap and synthetic detergent sales of 3.67 billion lbs., up 4.6% from 1954. Dollar sales were $860 million, up 8.5%.

Detergents held 63.2% of the market, poundwise, 12% more than in '54. Increasing popularity of liquid detergents was evident by their 29% gain in sales.

•

Expansion of another sort may put new tax burdens on three companies. The city of Deer Park, Tex., last week annexed about 9 sq. miles of adjacent land, which includes plants of Diamond Alkali, Rohm & Haas and Lubrizol. Deer Park last August annexed a strip of land around Shell Oil's petroleum and chemical plant, but did not actually take it into the city because Shell agreed to pay the city up to $125,000/year in lieu of taxes.

Another municipality, Walsenburg, Colo., will have its plans to attract industry tested in court. But there's a switch: testing the constitutionality of a 1955 state law that allows municipalities to sell revenue warrants to bring in industry will be Umbaugh Chemicals (Memphis, Tenn.). The firm plans to lease and operate three fertilizer units which the city would finance for $2.5 million. Cotarco, Inc. (*CW, Dec. 24, '55, p. 12*), plans a coal carbonization plant there, using $1.35 million of city warrants.

•

Texas City Chemicals' dicalcium phosphate plant is up for bids, and the company says it may change hands soon. Would another owner reopen the plant? It's problematic. The company is encouraging laid-off workers to find other employment.

•

"Interposition"—the technique being tried to combat desegregation by interposing a state's desires over those of the federal government—may find a new use. Now that President Eisenhower has vetoed the natural gas bill (*p. 21*), Texas Attorney General John Ben Shepperd says he will ask the state legislature to pass a resolution of interposition to keep the federal government from regulating the wellhead price of natural gas sold to interstate pipelines.



ALL ABOARD with Chromium Chemicals

Probably very few of the Aerotrain's 400 passengers know the extent to which Chromium Chemicals are riding with them. Of course, the gleaming chromium plated fixtures throughout the train are easily recognized, but not many passengers are aware that the engine's cylinder liners and bearing surfaces are hard chrome plated to reduce wear, or that Chromium Chemicals also play an important role in inhibiting corrosion in the engine's cooling system.

This new light-weight passenger train is another illustration of the way in which modern transportation takes advantage of the versatile properties of Chromium Chemicals to beautify, protect and preserve metal against wear and the elements.

For many years, the name Mutual has been synonymous with Chromium Chemicals of consistent high quality. Mutual products are available for prompt shipment from our Baltimore Plant or from dealers' warehouse stocks throughout the United States and Canada.

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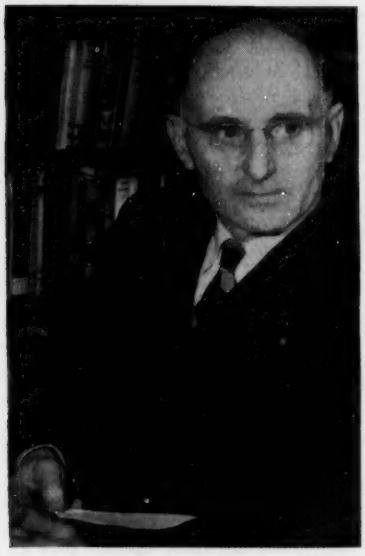
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Because of Case . . .

The decision to veto the natural gas bill was practically forced on President Eisenhower.

He delayed action to almost the last possible legal minute, hoping that new, and definitive, evidence on alleged undue influence on the legislation would turn up to let him change his mind. But the progression of events was too much for the ethical Eisenhower.

First, South Dakota's Sen. Francis Case (*above*) revealed he'd been offered a $2,500 contribution; then New York's Sen. Herbert Lehman charged that a New York firm asked its employees to urge senators to pass the gas bill. Lehman says the firm used the scare-words "Your job is at stake."

Now, even avid supporters of the measure admit there's virtually no chance of getting another such bill through Congress in the foreseeable future. And only hindsight will show whether producers will continue to develop natural gas supplies adequate for burgeoning demands when the price they can get selling to an interstate pipeline must be set by the Federal Power Commission.

If producers are reluctant to sell gas to pipelines, it may make the building of chemical process plants along pipelines much less attractive than locating them near gas fields.

Trouble Over Styrene

One of the largest claims—$18.5 million—in any civil case in Canadian history was filed late last week by Dow Chemical Co. and its Canadian subsidiary, charging misuse of its styrene patents.

Canadian government-owned Polymer Corp. (Sarnia, Ont.) is defendant.

Two separate actions are involved. The companies are claiming $15 million damages to compensate for loss of know-how royalties suffered through Polymer's styrene operations in Canada and its sales to U.S. customers.

This claim was filed in the Exchequer Court of Canada. Here, in addition to asking monetary damages, the companies want an injunction restraining Polymer from any further infringement of their patents.

The second action involves U.S. Dow as plaintiff, asking $3.5 million damages because Polymer allegedly broke faith in the Canadian General Styrene Agreement. Polymer signed this agreement with Dow and other U.S. firms in Oct. '42, when the synthetic rubber program was just getting under way.

This time, the Supreme Court of Ontario is the court that Dow asks for a ruling.

Polymer participated to obtain technical know-how for rubber production —and exchange of patent rights covering styrene was, of course, included.

Dow of Canada operated the Sarnia styrene plant up to Jan. '51, when Polymer Corp. took over. At that time, suit claims allege, Polymer agreed to royalty payments to Dow of Canada in return for styrene production know-how provided by the parent Dow.

By Oct. '54, however, Polymer had terminated this agreement, and since then, the Dow of Canada says, has continued to use its techniques, patents and processes freely.

What's more, demands that royalties be paid by Polymer for these services have been turned down, the Canadian subsidiary adds.

Dow reports that the sole company in Canada that has permission to use its styrene patents and know-how is its own subsidiary. Therefore, Dow alleges, Polymer is not only infringing on these but also breaking faith by putting to commercial use information offered to Canada in time of war.

Next act: filing of Polymer Corp.'s reply to the suit.

The Old Refrain

Merger rumors, like old soldiers, never die.

But unlike the soldiers, they seldom fade off into the distance. Take the case of Jefferson Lake Sulphur, which this week not only had a past merger discussion with Monsanto back to haunt it, but also was reported being eyed by American Cyanamid. And there's still another new candidate: Olin Mathieson.

Any one of the three would have good reason for further vertical integration. Jefferson is the third largest U.S. sulfur producer; too, it owns most of Merichem Co. And the sulfur industry, itself, has not had to scrimp on a low profit margin. Hence the reports—which, along with word of Jefferson's new Rotosorber process for selective removal of hydrocarbons from natural gas (*CW Business Newsletter, Jan. 7*)—have jumped its stock value by about 20%.

This increase came despite a slightly bearish earnings statement out this Monday. Though company sales were up 4%, to $9.3 million, its net earnings were down, to $1.7 million, 8% below 1954. This is somewhat misleading, though, since in '54 the company had a $600,000 net credit on a judgment against the state of Louisiana.

But ask Jefferson President E. H. Walet about the mergers—and he laughs. While reporting that his company had several talks with Monsanto a year ago, he adds that there's been no action with Monsanto lately.

Cyanamid? Olin Mathieson? Well, nothing to report there either.



KOPPERS' FOY (l.), MUNNIKHUYSEN: They chose a different route for . . .

Expansive Conservatism

Koppers Co. this week took a step that only a few established chemical companies have taken in recent years —it sold new shares of common stock —300,000—on the open market.

Such a move is unusual these days because of the tax situation; the cheapest way to get money for expansion is usually by selling bonds or getting a bank loan. But to Koppers, which already has firm plans to spend somewhat more than $100 million for expansion in the next four years (80% of it on chemical products), there's a good reason for bucking the trend. It believes it has found the right expansion balance, combining the risk-taking of the entrepreneur, with being enough of a financial realist to stay in the good graces of conservative bankers.

Its reasons for selling common stock:

• The stock market is relatively high, and it can get a good price per share. It is making the new issue directly available to the public—without first offering it to present stockholders. Said Chairman W. F. Munnikhuysen and President Fred Foy, in a letter to stockholders: public sale "will result in substantially greater proceeds to the company than would be realized from an offering to stockholders" (which would have to be at less than the market price).

• It's more difficult right now to get a low interest rate on bonds. Company officials point out that the 91-day U.S. government bonds that two years ago were available at a 1% rate now cost some 2.33% in interest. And a parallel—though not, of course, as striking—change has taken place in rates being charged for long-term loans or bond certificate interest. Money is tight.

• And, perhaps most important, it will keep debt ratio near its current, conservative 13% level. With an increase in stock base, Koppers could then get additional money from loans —and still not have more than a fifth of its capital in nonequity holdings.

Koppers, in fact, has made arrangements with banks for $30 million worth of credit. With the approximately $15 million it will take in on this week's sale, plus retained earnings, Koppers doesn't expect to need more than $10 million of such credit to finance its expansion.

Polyethylene's Take: Biggest part of the chemical division's new funds will be channeled into polyethylene production. Koppers already makes the high-pressure variety at its Port Arthur, Tex., plant, and may increase its capacity.

Large-scale production of the new low-pressure polyethylene is planned at two new plants. One of them, to be built on the Pacific Coast, will produce 50 million lbs./year and is scheduled to be operating by late '57. This will be a joint venture with Brea Chemical, a subsidiary of Union Oil. Blueprints for an East Coast unit with an initial annual production of 10 million lbs. have also been drawn up. Koppers hopes to up its over-all low-pressure capacity and production to 100 million lbs./year.

The company believes that the total market for low- and high-pressure polyethylenes will be about 1 billion lbs./year by 1960 and intends to grab a big piece of this.

As one official put it: "Producers of polyethylene are something like Irishmen. There are a lot more on St. Patrick's Day than on any other. Many companies that say they'll build, won't do it. We will—and we'll be one of the first on line."

Styrene-butadiene latex facilities at Kobuta, Pa., will be increased—though the company doesn't plan to use its butadiene-from-alcohol units (which the company was able to purchase from the government during last year's synthetic rubber plant sale) to provide the butadiene for such new facilities.

Resorcinol is another item that Koppers will push. While some one-time producers have dropped out of the market, Koppers sees increasing demand and will hike production at its Petrolia, Pa., plant some 40%.

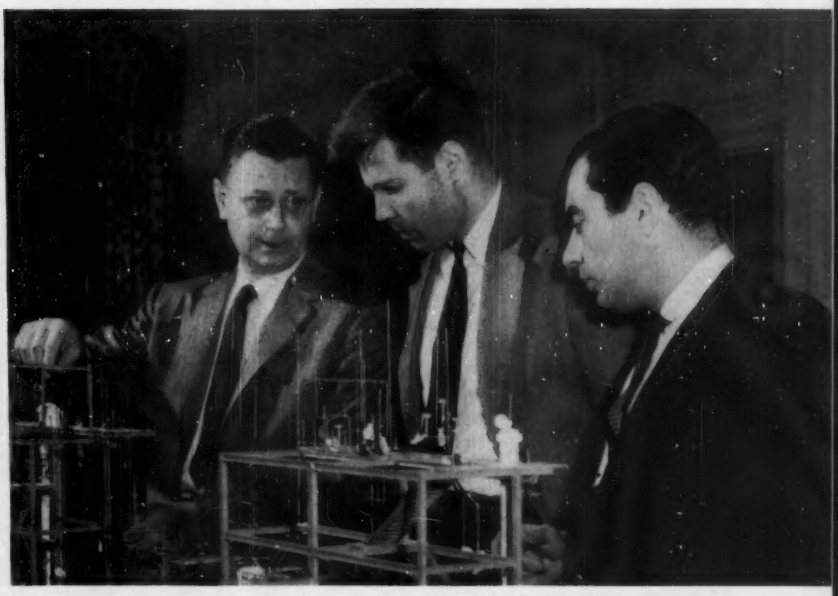
Nicotinic acid will be produced at a new million-dollar plant probably to be located in the Ohio Valley. Production will be in the neighborhood of 500,000 lbs./year.

Along with the new acid plant, a new million-dollar pilot plant will be built to explore the possibilities of more efficient recovery of the myriad of aromatic chemicals available in coal tar. In addition to such normal fractions as benzene, toluene, xylene cresylics, phenanthrene and anthracene, for which there are many commercial markets, Koppers believes that it can find new, commercial uses for such other derivatives as carbazole and acenaphthene.

A feature of this pilot plant will be facilities for coal hydrogenation, a subject that Koppers researchers have long been studying.

And it's a fair assumption that if it works out, there'll be some substantial spending commitments in the future for a larger hydrogenation facility.

Isocyanates—The Big Push Is Beginning



PATTERN FOR BUILDING: From this $22,000-model, a $10-million plant.

Isocyanate salesmen from Du Pont and Mobay are stepping up activities this week. Reason: in the last fortnight, both companies began production of tolyl diisocyanate—key intermediate in production of a wide variety of polyurethanes.

Though both firms have been selling pilot quantities of diisocyanate for some time, only now can the real race begin. And it could be quite a contest, for in the next three months, Allied Chemical's National Aniline Division should also be coming into big-time production.

You can easily see the hoped-for future. Where perhaps 1 million lbs. of diisocyanates were sold during 1955, these three plants have a yearly capacity of 40-50 million lbs.

Du Pont, with a $10-million unit, on-stream last week at its Deepwater, N.J., Chambers works, reports capacity as 25 million lbs./yr. Mobay's New Martinsville, W. Va., plant, with an estimated top operating level of 10-17 million lbs./yr., began production the week before. However, Mobay's "first" is clouded by the frank admission that not all parts of the isocyanate unit are actually operating —it's bringing in some materials from other places. National Aniline's 6-8-million-lb./yr. plant at Moundsville, W. Va., is expected onstream in the second quarter of this year.

There are, of course, other companies, such as B. F. Goodrich (Shelton, Conn.), Carwin (North Haven, Conn.), and Westvaco (Charleston, W. Va.), producing various diisocyanates. But there are only three big ones.



DU PONT AT DEEPWATER: A $25-million-lb./yr. plant goes onstream.

Where Now? When you try to get firm estimates of urethane production, you get widely varying answers. Du Pont's Bill Ayscue estimates 1955 production of diisocyanates at roughly 1 million lbs.; but others estimate as low as 300,000 lbs.

Estimates of the future market for the materials can bring an even wider variance.

It's generally accepted that the first big market for the materials will be in foams, rather than in, say, Vulcollan-type rubbers. But there's no denying that abrasion-resistant rubbers may someday be a volume market.

What will production be this year? Ayscue says it could be 5 million lbs., or even 10 million, depending on how soon—and whether—use of urethane foam in automobile crash-panels, or in furniture, catches on.

What's the Mix? With volume production, there may have to be some readjustment of foam formulations. Mobay, because of its 50% ownership by the German Bayer interests, first marketed a 65-35% mixture of tolyl-2,4-and-2,6-diisocyanates. (Bayer, with a market for *p*-nitrotoluene, performed a second nitration only on *o*-orthonitrotoluene—thus getting the 65-35 mixture.)

Du Pont, however, feels that the 80-20 mix produced by a straight dinitra-

tion is more practical for large-volume, cheap production. Each now sells both mixes for $1.05/lb.—but Du Pont tells its customers they might well standardize on the 80-20.

Urethane formulation is still much of a by-guess-and-by-golly thing. Besides the isocyanate isomer mix, major variables include the proportions of isocyanate and polyester resin, reaction time and temperature. Of the major foam producers only Lockheed—which with Du Pont and Mobay pretty much has the corner on urethane patents (*CW, Sept. 3, '55, p. 28*)—specifies the more expensive pure 2,4 isomer.

Another Rubber Sale?

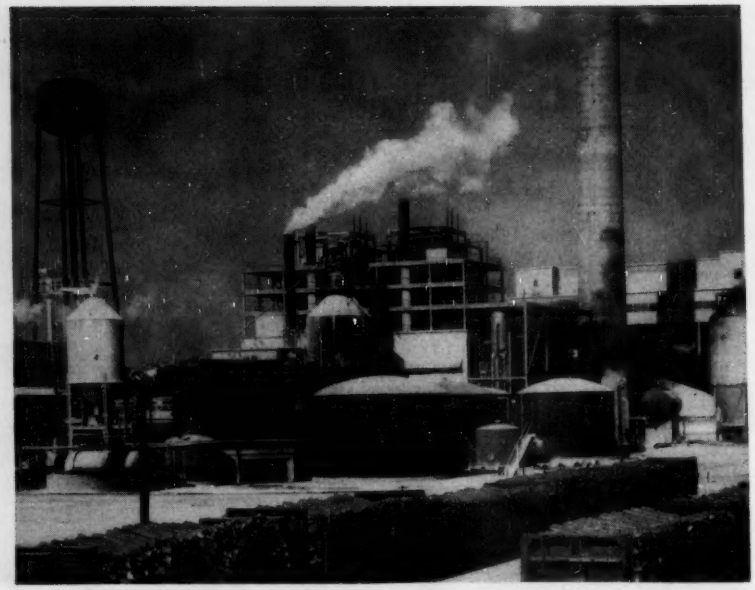
The Eisenhower Administration is pondering whether to try for a "quickie" sale of the government's $2-million synthetic rubber research and pilot-plant laboratories at Akron, O., following last week's decision by Akron University to abandon operations there June 30.

Acting on unanimous advice of its own committee, the university's directors flatly rejected a one-year, nonrenewable lease (starting July 1, 1956) offered a week earlier by the National Science Foundation. The school has operated the labs since World War II, running tests of materials developed by government synthetic rubber plants.

NSF, which took over the facilities when industry bought the synthetic rubber plants last year, will pick up the tab for the current fiscal year's $900,000 operating budget, plus a $50,000 management fee. Under the proposed lease, the university would have had to shoulder all financial risks, get no federal money.

The university's advisory committee, headed by Seiberling Tire and Rubber Co. Vice-President H. P. Schrank, said these terms made future operation by a tax-supported school "inadvisable," and warned against pitting skimpy university capital against unlikely first-year profit in this "risk venture."

With its "take it or leave it" lease plan dead, NSF is asking Budget Bureau clearance for legislation authorizing an immediate competitive-bid sale. If other agencies agree, NSF hopes to push the bill through Congress soon enough to get the labs out of government hands by July 1.



RAYONIER, JESUP: A low river, slimy nets put this plant in . . .

Fish Soup—Again

Every time the Altamaha River level drops dangerously low, Rayonier, Inc., finds its new $25-million Jesup, Ga., plant almost literally in the soup.

Only 17 months ago, the firm's spanking-new chemical cellulose plant faced a legal fracas over dead fish, allegedly killed by plant effluent. Quick investigation, then, on the part of Rayonier scientists showed the then-low river level could just as easily have produced the fish deaths.

Last week, a re-enactment: a delegation of touchy Altamaha River fishermen faced the Georgia legislature claiming Rayonier is "ruining edibility and salability of fish and crustacean life in the river below the plant."

In evidence, delegation members produced shad nets—allegedly put out some 35 miles downstream—which they contended were clogged and discolored by a "slimy substance" from the plant.

Further, they asserted, fish caught were "odorous" and unfit for eating. Two declared that at least three coastal families had been hospitalized with stomach ailments just after eating Altamaha shad.

Enjoinder? Winding up its plea, the delegation threatened to file an injunction unless the offender was determined and stopped immediately.

Following that stormy session, State Attorney General Eugene Field conferred with the delegation and Rayonier attorney Allen Lockerman. Result: a temporary agreement that a detailed investigation would be initiated by Cook's office, the State Health Dept. and the Game & Fish Commission.

Rayonier, meanwhile, had thrown in supplementary forces to bolster its side of the story. Over the weekend, Charles Renn, professor of stream biology at Johns Hopkins, went to Jesup to review available reports on the fouled nets. And Rayonier Manager Fred Doherty used him as mentor in following up the investigation.

Rejoinder: Doherty is quick to point out, too, that Rayonier discharges have had no apparent effect on the fish population. And that's confirmed, he says, by local reports of continuing good catches since mill operations commenced in 1954. Further, Rayonier is already sporting a going program to check river contamination. And since no injunction has been filed—up to now—against Rayonier for changing fish odors or taste, there's no question, at the moment, of a court hearing.

Luckily for Rayonier, too, Georgia has no antipollution law. One was approved by the legislative committee

last week, but it occurred just too late for its enactment into law, since the legislature has adjourned. This means that to become law, a bill will have to go through the mill again next year.

As matters stand now, there's a bright spot on the horizon for everyone—the long-overdue rain now falling across the state. January saw record lows on practically all Georgia Rivers, including the Altamaha. Low water could be, as in the 1954 fish-kill episode, the main culprit. In any event, Rayonier and state investigators are mighty busy right now.

If a solution isn't forthcoming from them soon, Rayonier may yet be the object of an injunction.

Changing Profile

Cubatao, a suburb of Brazil's bustling port city of Santos, is due for a chemical face lifting.

Right now the town quarters Petrobras' refinery complex, it awaits Union Carbide's recently announced polyethylene plant adjacent to this, and will soon harbor a newcomer.

According to Augustine Marusi, Borden's Chemical Division president, that will be a $3.5-million methanol plant—Brazil's first—coupled with a formaldehyde and synthetic resin producing unit on the same spot. It's scheduled for completion by 1958, will be Borden's latest chemical expansion in South America where the firm already has going chemical interests.



KORSEN

BORDEN'S MARUSI: For Brazil, methanol.

The plant actually will be run by Alba, S.A., the Brazilian company in which Borden International, Ltd., Canada, holds majority stock interest.

Current Basis: Alba now makes formaldehyde, plastic materials, and adhesives at its Curitiba plant south of São Paulo. Brazil's largest methanol user, it now depends on imports.

By 1958, though, with doubled formaldehyde and synthetic resin capacity coming at Cubatao, Alba will use much of its own 30-tons/day methanol capacity.

Current Exchange: What methanol Alba doesn't take will go to textile, leather, paper, and plastics makers in the immediate area. In fact, Marusi figures, Brazilian industries could realize an exchange saving of at least $1 million/year when the plant first comes into operation. Such savings could increase to $1.8 million when demand equals capacity, perhaps by 1961.

Since some U.S. chemical producers have hesitated to sell Brazilian markets because of slow transfer of funds, Borden's new methanol expansion should be doubly welcomed there.

Financing will come partly from the Export-Import Bank ($1.33 million), the rest from Alba, Borden International and Brazilian investors. Alba will put up the working cash.

Turnover Tax Curbed

France's "turnover" tax, for two years a source of frayed tempers among U.S. manufacturers, may soon be revamped.

The tax, a levy on all business transactions in that country, does not apply to royalties earned by inventors. Until two years ago, U.S. companies receiving royalties from French firms using their patents and production "know-how" likewise were exempt.

When French authorities suddenly billed U.S. firms, demanding retroactive "turnover" payments running into several million dollars, such U.S. groups as the Manufacturing Chemists' Assn. and the American Drug Manufacturers Assn. asked Treasury Secretary George Humphrey to go to bat with the French government for them.

The U.S. concerns, unable to produce all the ownership documents needed to win exemption from the French tax, sought a blanket exemption.

After more than a year of negotiations, the French government has agreed—effective Feb. 15—to grant a flat exemption on payments made directly to the U.S. owners and has promised to "study with understanding" companies' tax liabilities.



WIDE WORLD

RAMADIER: He'll review 'with understanding' the U.S. claims.

Carrying out these studies will be French Minister of Finance and Commerce Paul Ramadier, who will have charge of all future negotiations with the U.S. regarding these levies.

Will it work? Washington tax men are still afraid U.S. companies may have a hard time proving ownership interest in various patents.

COMPANIES . . . .

Procter & Gamble stockholders will vote at a special meeting on May 22 on a proposal to increase the number of authorized common stock from 15 million shares of no par value to 25 million of $2 par value. If ratified, outstanding shares would be split 2 for 1.

•

United Dye and Chemical will hold a special meeting of stockholders of record Feb. 20 to vote on merger of Handridge Oil Corp. into United.

EXPANSION . . . .

Ilmenite: National Lead this year will complete a 25% expansion in its ilmenite mine and ore processing mill at Tahawus, N.Y.

•

Chlorine/Caustic: A $4-million ad-

Washington Angles »»

»» You'll be getting a call from the FBI if you buy or sell synthetic rubber. The Justice Dept.'s antitrust chief, Stanley N. Barnes, has turned to FBI field agents for help in running a complete check on some 800 companies so he can tell Congress whether synthetic rubber suppliers are living up to the pledge they made when they took over government plants: to sell a fair share of production to small consumers.

Barnes will report his findings May 1—and he's promised to conduct similar surveys each year through the next decade.

»» More money for heart disease research seems a certainty, members of the House Appropriations Committee predicted after hearing Eisenhower's heart specialist, Dr. Paul Dudley White, in closed session last week. White urged Congress to provide 35% more than the $22,106,000 in heart research funds requested by Eisenhower. The $22 million is a step-up of $3.5 million from the current year's program.

»» The rejection rate on paint and paint items by the General Services Administration dropped from about 35% in previous years to 15% in 1955. Total rejections for all items, GSA says, dropped from 1.5 to 1.1% in same period.

"Continued rejection of supplies not meeting specifications" has discouraged "certain subspecification suppliers from bidding and has made the remaining suppliers more conscious of the fact that material supplied must comply with contract requirements."

»» Food additives legislation this year? It now hangs on the remote chance that food and chemical processors can hammer out a quick compromise with the Food and Drug Administration. FDA Commissioner Larrick and Counsel Goodrich told a House Commerce subcommittee last week they'll never take industry's bill with the present enforcement feature, which requires FDA to prove in court lack of safety to keep harmful additives off the market.

Committee Chairman Priest, who leans toward FDA's position, sees this dispute as the one "big hitch" toward getting agreement. He insists that all differences be settled before he'll let a bill reach House floor.

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dition to its Frontier Chemical Division plant for chlorine and caustic soda at Denver City, Tex., is planned by Union Chemical & Materials Corp.

•

Ammonium Nitrate: New facilities for production of solid ammonium nitrate will be installed at the Hopewell, Va., plant of Allied Chemical's Nitrogen Division.

•

A joint U.S.-British $50-million pulp and paper facility may be built in New Brunswick, Canada. Lepreau, near St. George, is one possible site for the plant. Great Lakes Carbon Corp. is participating in the talks.

•

A $17-million plant addition will be built by Brown Co. (Berlin, N.H.). Included are a chlorine dioxide unit, a waste liquor recovery system, a kraft pulp bleachery, and sulfite pulp indirect cooking systems.

•

Synthetic Rubber: Texas-U.S. Chemical (Port Neches, Tex.) will add 35% to its butadiene-styrene copolymer producing capacity. This will boost potential GR-S output to 275 million lbs./year by May.

•

Cement: Oregon Portland Cement Co. at Lime, Ore., will double its cement producing capacity to 1 million bbls./year at a cost of $3 million.

•

Glycerine: Dow Chemical will add "substantially" to its 36-million-lbs./year glycerine production capacity at Freeport, Tex.

FOREIGN. . . . . .

Fertilizer/Egypt: Formation of a new Egyptian fertilizer producer, the Egyptian Chemical Industries Co. has been approved by the government. The new plant will be located near Aswan Dam and will utilize electric power to be generated there and at the projected High Dam to turn out a minimum of 1,160 tons/day of nitrogen fertilizer. A French-German consortium, the French Kuhlmann and CITRA and West Germany's UDA and Badische Anilin, has signed a contract with Egyptian representatives to build the new installation for $34.5 million. The cost of the entire project, including housing, transport and insurance, is estimated at $60 million. Several Egyptian banks and insurance companies will help finance the new plant, which should be in operation by late 1959.

•

Graphite/Holland: Acheson Industries of New York will build a new colloidal graphite manufacturing plant in the borough of Scheemda, Netherlands, at a cost of approximately $135,000. The Scheemda unit is expected to meet all the needs of Continental as well as Dutch markets.

•

Copper/Chile: Andes Copper Mining Co., a subsidiary of Anaconda, announced that it expects to spend $53 million over the next four years to bring its newly discovered mine near Indio Muerto mountain into full production. The expected yield is 100,000 tons of copper annually.

•

Expansion/Mexico: A new sulfuric acid plant with a capacity of 50 tons/day is scheduled for completion early in May at Monsanto Mexicana's production plant near Mexico City—where production of aspirin began early this month.

ADVERTISEMENT— *This entire page is a paid advertisement* *Prepared by U. S. Industrial Chemicals Co.*

U.S.I. CHEMICAL NEWS

Feb. 25 ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1956

Phosphoric Acid Plant Planned by U.S.I.

Plans to build a new plant at Tuscola, Illinois to produce wet-process phosphoric acid have been announced by U.S.I.

Annual production capacity will be 60,000 tons of 75% phosphoric acid, produced from sulfuric acid and phosphate rock by a process developed by the S. A. Metallurgique de Prayon, a Belgian company. Singmaster and Breyer will engineer and construct the plant, which is expected to start operating at the end of 1956.

U.S.I. already produces sulfuric acid, ammonia and nitrogen solutions at Tuscola. The addition of phosphoric acid to this range of fertilizer raw materials will substantially expand the scope of U.S.I.'s service to fertilizer manufacturers in the mid-west farm belt.

U.S.I. Changes to 55 Gallon Drum Filling

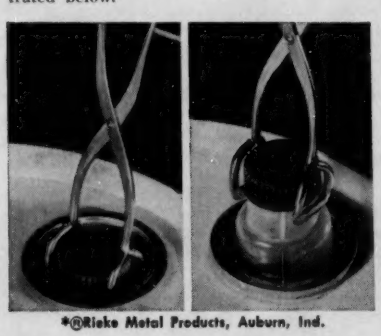
As of January 1 U.S.I. is using a new drum for shipment of SOLOX® Proprietary Solvent Alcohol and a number of other solvents. This new standard drum is gradually being adopted by most suppliers, and will eventually become standard for all U.S.I. products. Net capacity is 55 gallons — the older one contained 54.

Because of the stocks of filled drums maintained in U.S.I. warehouses for customer convenience, 54 gallon drums will be shipped until inventory is depleted.

New Folder Aids U.S.I. Alcohol Users

Five-gallon drums of U.S.I. ethyl alcohol, USP come equipped with the FlexSpout* closure, a leakproof, tamperproof polyethylene spout which offers alcohol users greater convenience in handling and pouring. Five-gallon drums of SOLOX®, U.S.I.'s proprietary denatured alcohol solvent, and many other U.S.I. chemicals and solvents are also equipped with this closure.

An illustrated folder now available from U.S.I. describes the closure and shows how it can best be opened. Although mentioned only briefly in the folder, some users have discovered that a pair of ordinary kitchen tongs, the kind normally used for handling baby bottles, also makes an excellent opener for the FlexSpout. The technique is illustrated below.



*@Rieke Metal Products, Auburn, Ind.

WORLD'S FIRST COMMERCIAL ISOSEBACIC ACID PLANT PLANNED BY U.S.I. FOR 1957

New Intermediate Shows Promise In Plastics Industry For Plasticizing And Other Functions

The first commercial plant in the world for the production of isomers of sebacic acid, known as "U.S.I. Isosebacic" acid, will be built at Tuscola, Illinois. Initial production capacity of the plant will be 10 million pounds per year and completion of the plant is scheduled for early in 1957. Catalytic Construction Company of Philadelphia, will be engineers and contractors for the project.

"U.S.I. Isosebacic" acid is a mixture of isomers of sebacic acid in approximately the following proportions:

2-ethylsuberic acid	72-80%
2,5-diethyladipic acid	12-18%
Sebacic acid	6-10%

This new product is the result of more than three years of research which began under the auspices of a National Distillers' fellowship at the University of Cincinnati and progressed through the company's research laboratory. For the last two years, "U.S.I. Isosebacic" acid has been in pilot plant production, first at U.S.I.'s former Fairfield plant and more recently in the company's new pilot plant facilities at the Cincinnati Research Laboratory.

The Cincinnati pilot plant will continue to operate to supply samples and to develop further process refinements until the Tuscola plant comes on stream.

Over 400 research laboratories already have received samples of "U.S.I. Isosebacic" acid for evaluation. The product shows considerable promise as a raw material for vinyl resin plasticizers with excellent low-volatility, non-migration, and low-temperature characteristics.

Other promising applications include: the production of polyamide (nylon type) mold-

MORE



"U.S.I. Isosebacic" acid goes into plasticizers for vinyl resins, which are used to make items such as the plastic curtains shown here.

Minimum Daily Methionine Requirement Reaffirmed

Recent research has reaffirmed that for healthy adults, a minimum daily intake of 1.1 gm. of methionine is required to maintain positive nitrogen balance in humans.

As with other amino acids, the exact amount varies slightly from one individual to another, but appears to be independent of body weight, surface area or creatinine output.

D-Methionine, in contrast to the behavior in man of the D-isomers of all other essential amino acids, proved during tests to be equally as effective as DL-methionine in the maintenance of nitrogen balance. From this it follows that the L-isomer has no greater metabolic activity than the Racemic mixture (DL-methionine).

The amount of 1.1 gm. of either the L- or the DL-isomer was tentatively established as the minimum daily requirement of man, and 2.2 gm. was recommended as a safe daily intake.

Sodium Dispersion Package Units Can Now Be Purchased

Two package sodium dispersion units have been placed on the market by the Cowles Dissolver Company, Cayuga, N. Y. Both models, the 1000-2000 ml laboratory unit and the 3-7 gallon pilot unit, have been designed jointly by Cowles and the U.S.I. Research Department.

Although all the necessary parts, from motor drive to thermometer are contained in these package units, heart of each model is the Cowles "Dissolver", the particular impellor design that has been found extremely efficient in dispersing sodium in an inert organic medium.

The laboratory unit consists of 2 liter resin flask, metal thermometer, copper coil condenser, dropping funnel and 3″ Cowles "Dissolver". Heat is furnished by Glas-Col electric heating mantle. The "Dissolver" is attached to ½″ shaft connected by flexible

MORE

Feb. 25 ★ **U.S.I. CHEMICAL NEWS** ★ 1956

CONTINUED **Isosebacic**

ing and extrusion plastics and adhesives; alkyd resin manufacture, to impart flexibility and water resistance to the surface coating film; the synthesis of ester lubricants of the type used in jet propelled aircraft; the production of polyester resins used in the manufacture of glass reinforced plastics; the synthesis of polyurethane resins for foamed plastics, synthetic rubber and protective coatings.

This new chemical is produced by a novel process for which the principal raw materials are butadiene, a petrochemical, and sodium, of which U.S.I. is an important producer. Tuscola was chosen as the location for the new plant because of the availability of raw materials at this site — hydrocarbons from National Petro-Chemicals Corporation as well as sulfuric acid and other raw materials from the adjacent U.S.I. installation.

Electrical Grades, U.S.I. Polyethylene, Introduced

The PETROTHENE® 300 series of electrical grade polyethylene resins has just been introduced to meet the variety of electrical specifications for infantry field wire, line wire covering, TV lead-in wire, high frequency and high voltage insulation and, in general, all wire and cable insulating and jacketing applications.

Melt indexes for the uncompounded grades are as follows:

PETROTHENE 300 — 0.3
PETROTHENE 301 — 1.0
PETROTHENE 302 — 2.8

Each of these types is also supplied compounded with antioxidant, with antioxidant and carbon black, with non-discoloring antioxidant, and with non-discoloring antioxidant and carbon black, as well as with other colors.

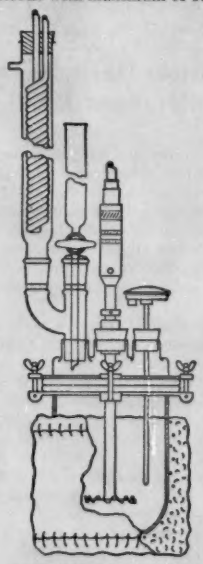
PETROTHENE 300 and 301, uncompounded materials, can also be used for other applications requiring very high molecular weight material, and requiring high toughness and resistance to environmental stress cracking. Blow molded bottles and closures that are exposed to solvent type detergents, cosmetics, etc., are possible applications.

CONTINUED **Sodium**

coupling to high speed motor.

The laboratory procedure for preparing dispersed sodium is described in the U.S.I. brochure "Sodium Dispersions". Sodium, dispersing medium and dispersing aid are charged into flask and heated to 110-120°C and whole system kept under dry nitrogen atmosphere. Baffling is not required. Once temperature is above the melting point of sodium, the motor is started and allowed to reach 4000-5000 rpm. range. Particle size of 2-20 microns (checked with a microscope with a calibrated eyepiece) is obtained in 6-8 minutes.

No loss in dispersing efficiency has been observed in scaling up from laboratory to pilot plant. For example, preparation of 3-4 gallons of sodium dispersion in 5-gallon vessel with 6" "Dissolver" may be accomplished in 10-20 minutes. Sodium particle size averages 6-8 microns with maximum of 15 microns.



SODIUM DISPERSION PACKAGE UNIT (LABORATORY MODEL)

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Temporary window closures of polyethylene film are being used on construction jobs, permitting work to continue in bad weather. Film has blocked winds up to 65 miles per hour, holds in heat, admits daylight. **No. 1130**

Film badges for detecting radiation are now available to insure personnel protection in x-ray and radioisotope labs, industrial plants doing gamma radiography, and doctor's and dentist's offices. Badges read from .05 to 300 r. **No. 1131**

New refined liquid lanolin has high solubility, stability, versatility in drugs and cosmetics. Amber-colored oil is result of 11-step refining process. Properties same as lanolin except non-tacky, lower melting point. **No. 1132**

Polyethylene gas scrubber, recently developed, resists chemical attack at temperatures up to 170°F. Will be used with hydrofluoric acid and fluorides. Designed for gas flow of 2500 cu. ft./min. at 1½ psi. **No. 1133**

New volatile solvent concentrate acts as strong synergist with low-cost solvents, boosting dissolving power and drying performance. Does not burn, imparts fire extinguishing properties, has relatively low toxicity. **No. 1134**

To hold temperatures close to Absolute Zero, new type refrigerator has been developed based on cyclic principle of magnetic cooling. No moving parts or flowing fluids. First apparatus to both produce and maintain extreme cold over long periods. **No. 1135**

Colored aluminum for architectural use now made possible by treating anodized aluminum with new lightfast organic dyes. The colored anodic films are part of metal surface itself—will not peel, chip or scale. **No. 1136**

Succinic acid, organic polybasic acid, now available commercially for formulation of plasticizers, polyesters, alkyd resins, paints, drugs, cosmetics, chemical intermediates. **No. 1137**

Paper made wholly from nylon fiber, produced commercially for first time, is many times stronger than conventional types. Resists action of chemicals, mold, bacteria, light. Absorbs little moisture. **No. 1138**

Aqueous calcium stearate dispersion has been developed to improve coating formulations for machine coated papers. Product improves gloss, effective plasticizing, water repellency; provides lubrication, non-dusting, good flow. **No. 1139**

PRODUCTS OF U.S.I.

AGRICULTURAL CHEMICALS:

Ammonia, Anhydrous—Commercial and refrigeration grades in tank cars or tank wagons.

Nitrogen Fertilizer Solutions—Aqueous solutions of ammonium nitrate and ammonia in all standard analyses.

Sulfuric Acid—All strengths from 60° Baumé to 40% Oleum. Also Electrolyte grade meeting Federal Specifications. Tank cars or tank wagons.

OTHER PRODUCTS:

Alcohols: Ethyl (pure and all denatured formulas), Normal Butyl, Amyl, Fusel Oil; Proprietary Denatured Alcohol Solvents SOLOX®, FILMEX®, ANSOL® M, ANSOL® PR.

PETROTHENE® Polyethylene Resins.

Inorganic Chemicals: Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide.

Esters, Ethers and Ketones: Normal Butyl Acetate, Dibutyl Phthalate, Diethyl Carbonate, Diethyl Oxalate, Ethyl Acetate, Ethyl Ether, Acetone.

Intermediates and Fine Chemicals: Acetoacetarylides, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate solution, Urethan USP (Ethyl) Carbamate).

Animal Feed Products: Calcium Pantothenate, Choline Chloride Products, Curbay B-G® 80, Special Liquid Curbay®, DL-Methionine, Niacin USP, Riboflavin Concentrates, Vitamin B_{12} and Antibiotic Feed Supplements, Vacatone® 40, Vitamin A, D_3 and K_3 products.

Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Riboflavin USP, Urethan USP, Intermediates.

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Division of National Distillers Products Corporation
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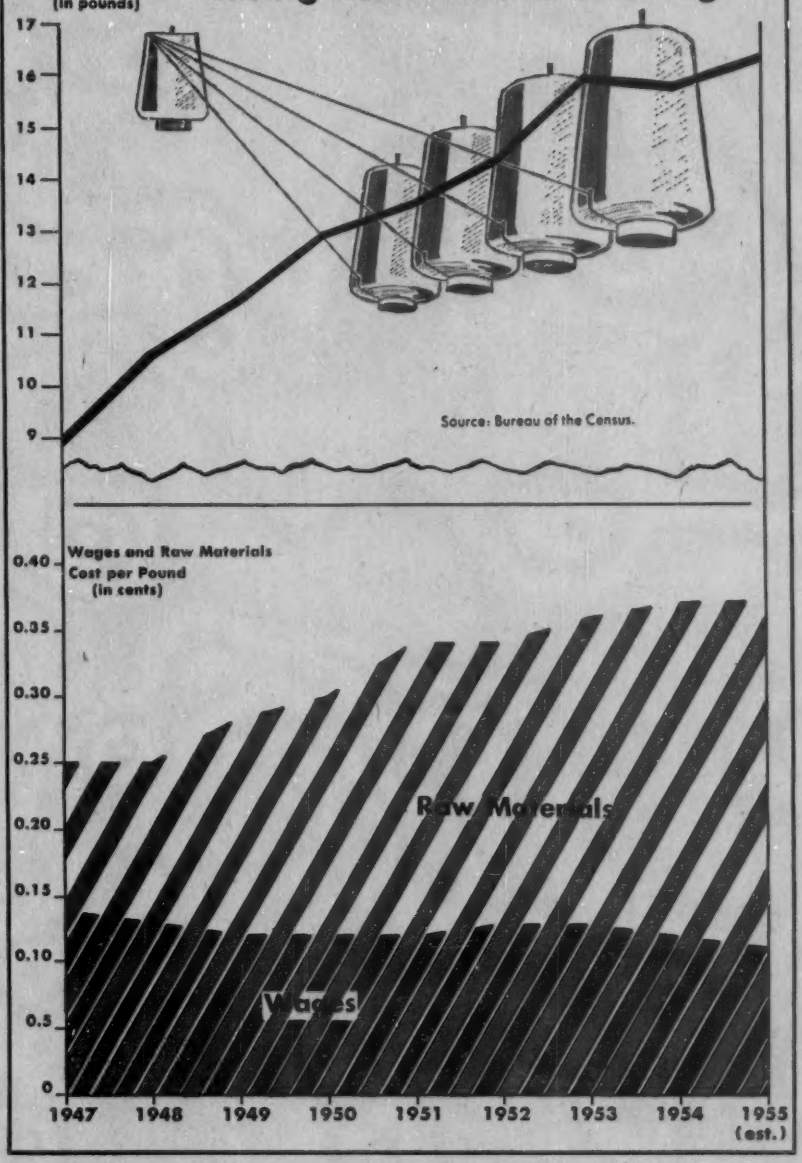
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Charting Business

CHEMICAL WEEK
February 25, 1956

PICK UP IN PROFITABILITY:

Mechanization Gains Outpace Rising Costs in Fiber Making



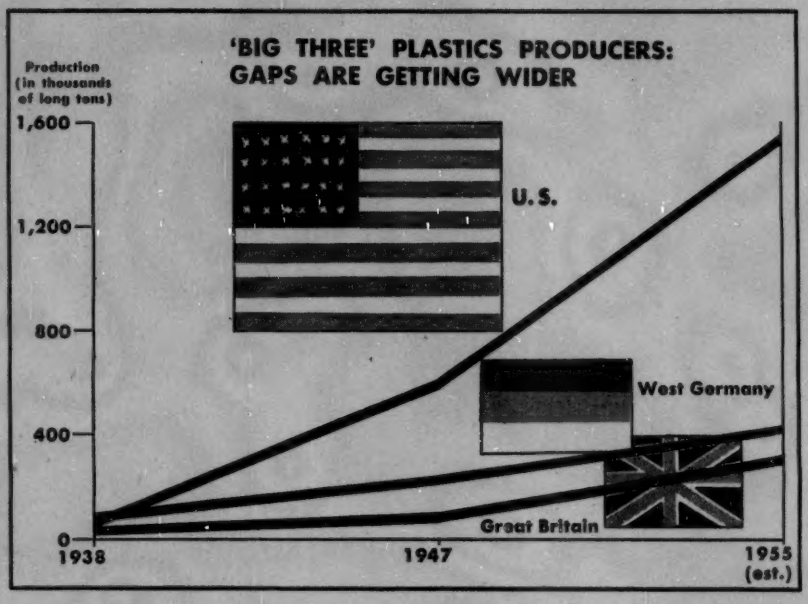
THOUGH much of the industry lies south of the Mason-Dixon line, U.S. synthetic fiber makers have shown Yankee ingenuity in pushing productivity up by 80% in the past 10 years.

Over the same period, wages have mounted from $1.30/hour to $1.90; but because of the higher productivity, labor cost per pound of product has declined slightly, dropping from 14¢ to 11¢. Raw material costs, on the other hand, are up by 48%.

Chief factor behind the productivity increase: intensive mechanization.

Charting Business

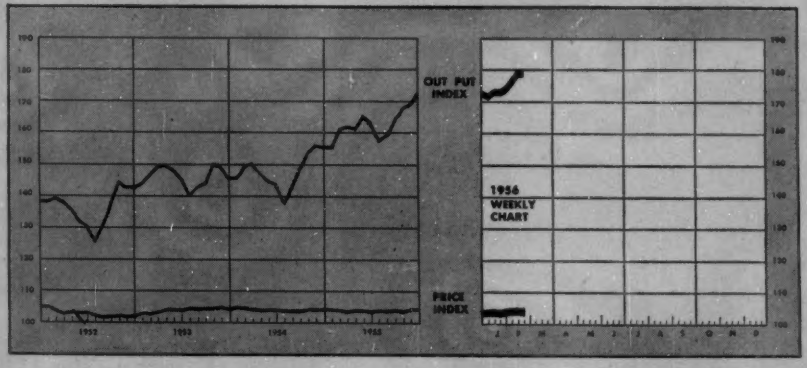
(Continued)



WEST Germany and Great Britain registered impressive gains in plastics production during the postwar decade, but the U.S. is still tops and seems to be extending its lead each year.

One reason: increasing use by U.S. industry of already-existing products and ever-widening application in new fields, such as reinforced polyesters, which in many cases have proved superior to metals. Examples: pressure-molded drier trays, stacks for processing units; tanks used in evaporation processes; and polyester tanks for electroplating.

BUSINESS INDICATORS



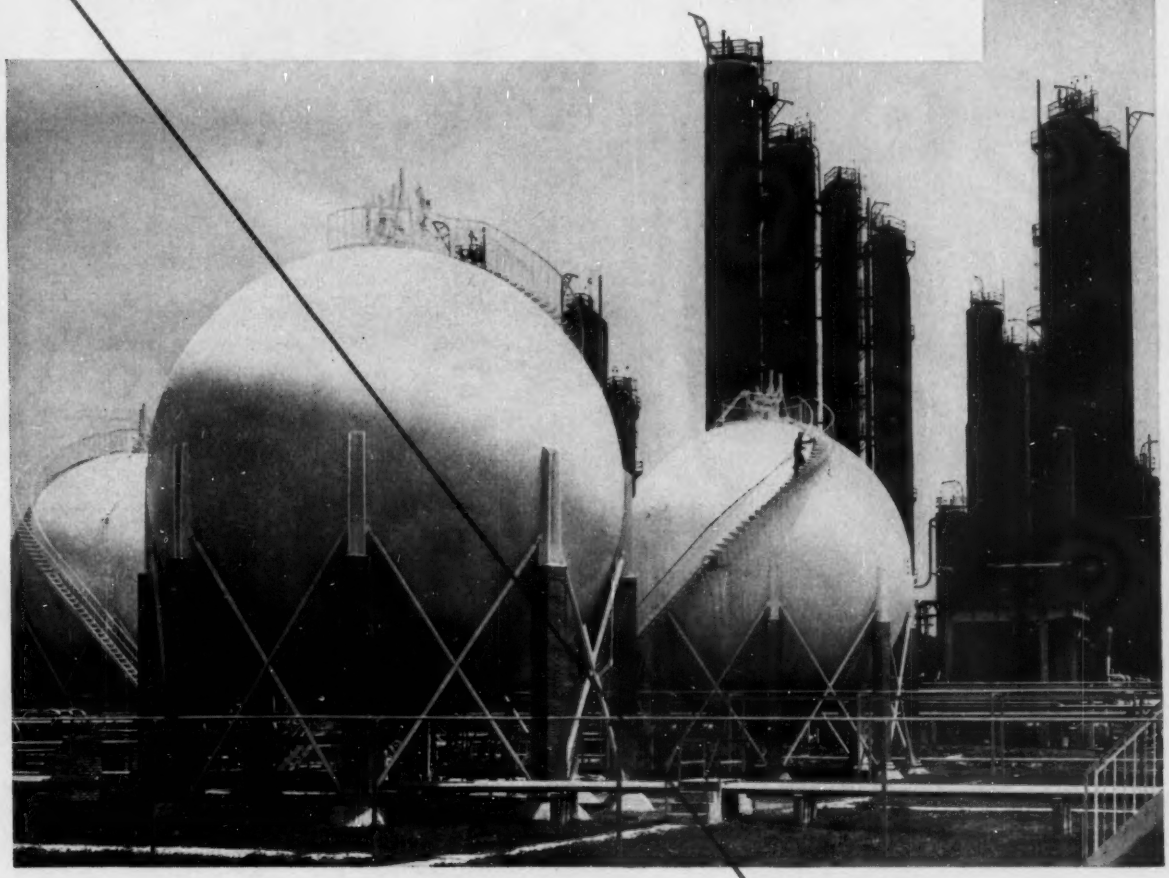
WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	180.0	180.5	161.5
Chemical Week Wholesale Price Index (1947=100)	105.2	105.3	104.4
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	460.0	458.7	372.7

MONTHLY—Wholesale Prices (Index 1947-1949=100)

	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	120.2	119.8	115.2
Chemicals and Allied Products	106.3	106.6	107.1
Industrial Chemicals	120.0	119.4	117.3

the name to watch in petrochemicals



Petro-tex came actively into being in April, 1955 with the acquisition of the facilities of the Government's Houston butadiene plant. Today, more than 50% expansion of capacity is well along to keep pace with the surging demand for rubber and to provide a surplus for new butadiene applications.

Alertly manned with experienced personnel and constructively at work on new markets, Petro-tex is the name to watch in butane-derived petrochemicals. We will welcome the opportunity to discuss your needs.



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TENNESSEE GAS TRANSMISSION COMPANY AND FOOD MACHINERY AND CHEMICAL CORPORATION

FROM ENGINE TO "INJUN"...



Which of these materials do you need? *Call RCI!*

1. **RCI phenol-formaldehyde resins**—permit fast curing of shell molds for intricate engine parts; help create long-lasting battery separators; serve as efficient, economical binders for fibrous glass hood insulation and the brake linings required to control today's higher horsepowers. (And top quality RCI *phenol* goes into important engine oil additives.)

2. **RCI surface coating resins**—include alkyd resins for superior automotive finishes and polyvinyl acetate emulsions for durable exterior masonry paints.

3. **RCI polyester resins** — combine with diisocyanate to produce polyurethane foams (currently being considered for auto seat cushions); permit fast production and uniform results in such reinforced plastics products as sturdy boat hulls and water skis.

4. **RCI pure and modified phenolic resins** — make auto waxes and polishes harder and longer-lived.

5. **RCI pentachlorophenol** — is an important ingredient in easily-applied preservatives for wood. It helps make wood exposed to weather last for many years.

6. **RCI urea-formaldehyde resins**—add wet strength to paper "windshield towels."

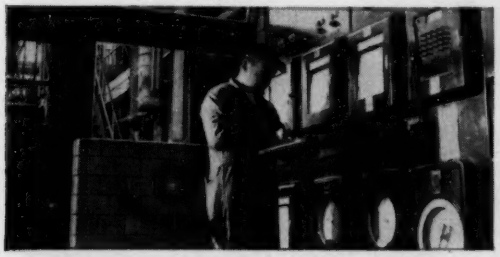
7. **RCI ester gums** — constitute the base for many of today's bubble gums; are also used in leather adhesives.

The next time you have a supply problem (or a technical problem), take a look at RCI. See where fast delivery of these quality-controlled RCI materials (or any of those listed with our signature) can help *you*.

. . RCI is in the Picture!



MALEIC ANHYDRIDE—Reichhold produces and sells this important basic chemical; and uses it in making POLYLITE polyester resins. Here RCI operator checks main controls in maleic plant.



PLASTIC BEAUTY—RCI POLYLITE polyester resin is used to build the reinforced plastic hull of a high-speed outboard fourteen feet long. This ultra modern craft weighs only 350 pounds.



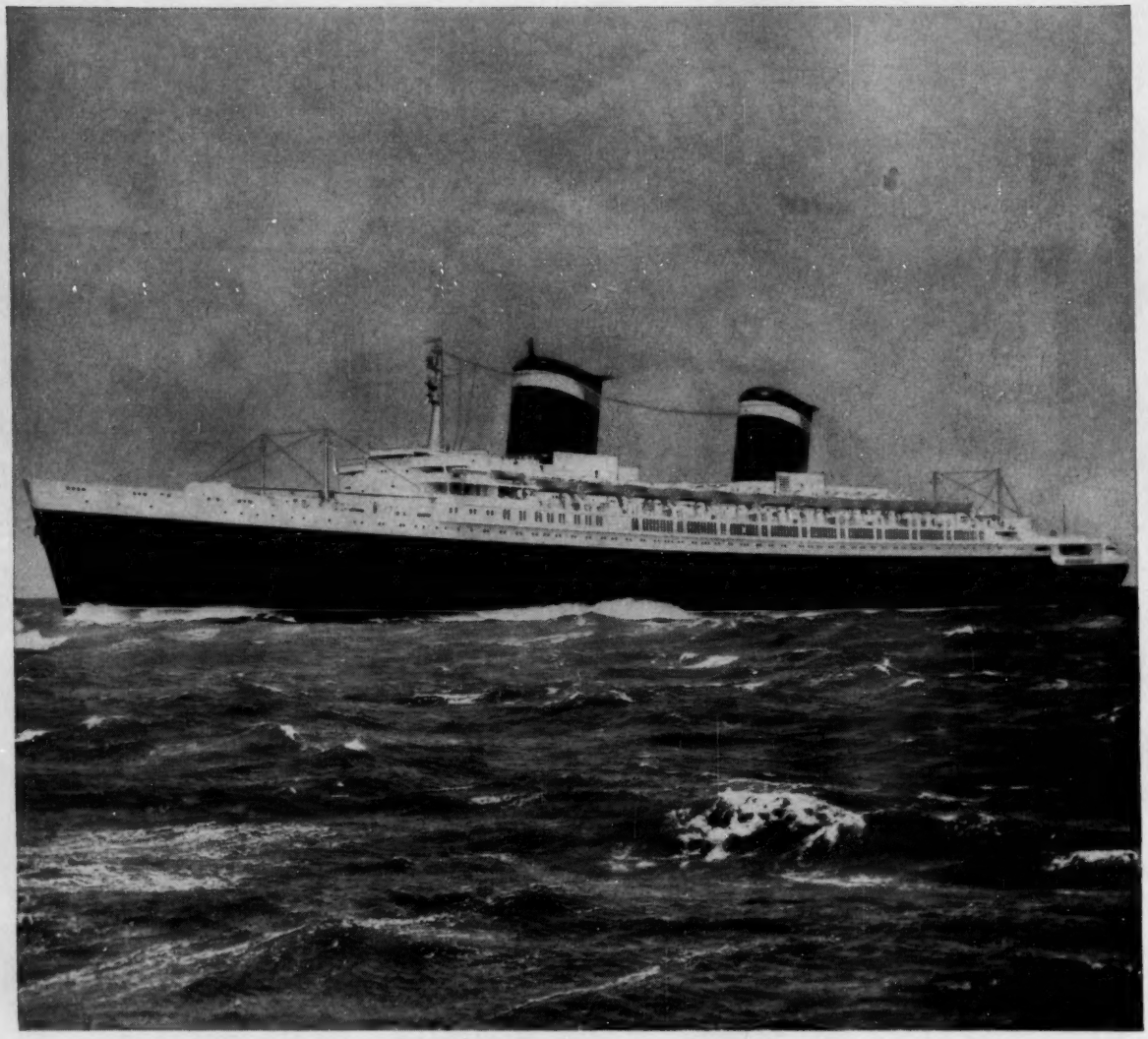
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MISSOURI PACIFIC R.R.

RAILS AND RIVERS TO EVERYWHERE: At hub of mid-continent transportation system, chemical firms share in . . .



ST. LOUIS CHAMBER OF COMMERCE

New Spirit of St. Louis: Civic, Industrial Rebirth

Still another round of chemical industry expansion is in the offing for the mid-continent metropolis of St. Louis this week as that city—eighth largest in the U.S.—gets ready for a "Mid-America Jubilee" to be held there in September.

At the age of 192 years*, St. Louis has adopted as the theme for those fall festivities the phrase "Rebirth of a City." This alludes to the fresh start the city is making—backed by a $10-million municipal development bond issue—on such vital housekeeping projects as flood control, expressways, piers and docks, slum clearance, street improvement and parking.

And several of the principal chemical companies in the 1.8-million population area are also thinking in terms of new beginnings. This is particularly true of Monsanto, the chemical giant of the area. The firm is putting up five new headquarters buildings just outside the St. Louis city limits (estimated cost, $5 million) and a new inorganic research laboratory—in which plastics will be used to the maximum practical extent—at nearby Creve Coeur, Mo., to centralize operations now carried on in Ohio and Massachusetts.

*Founded in 1764 by French explorers and fur traders, who in 1699 had first come to what is now the state of Missouri.

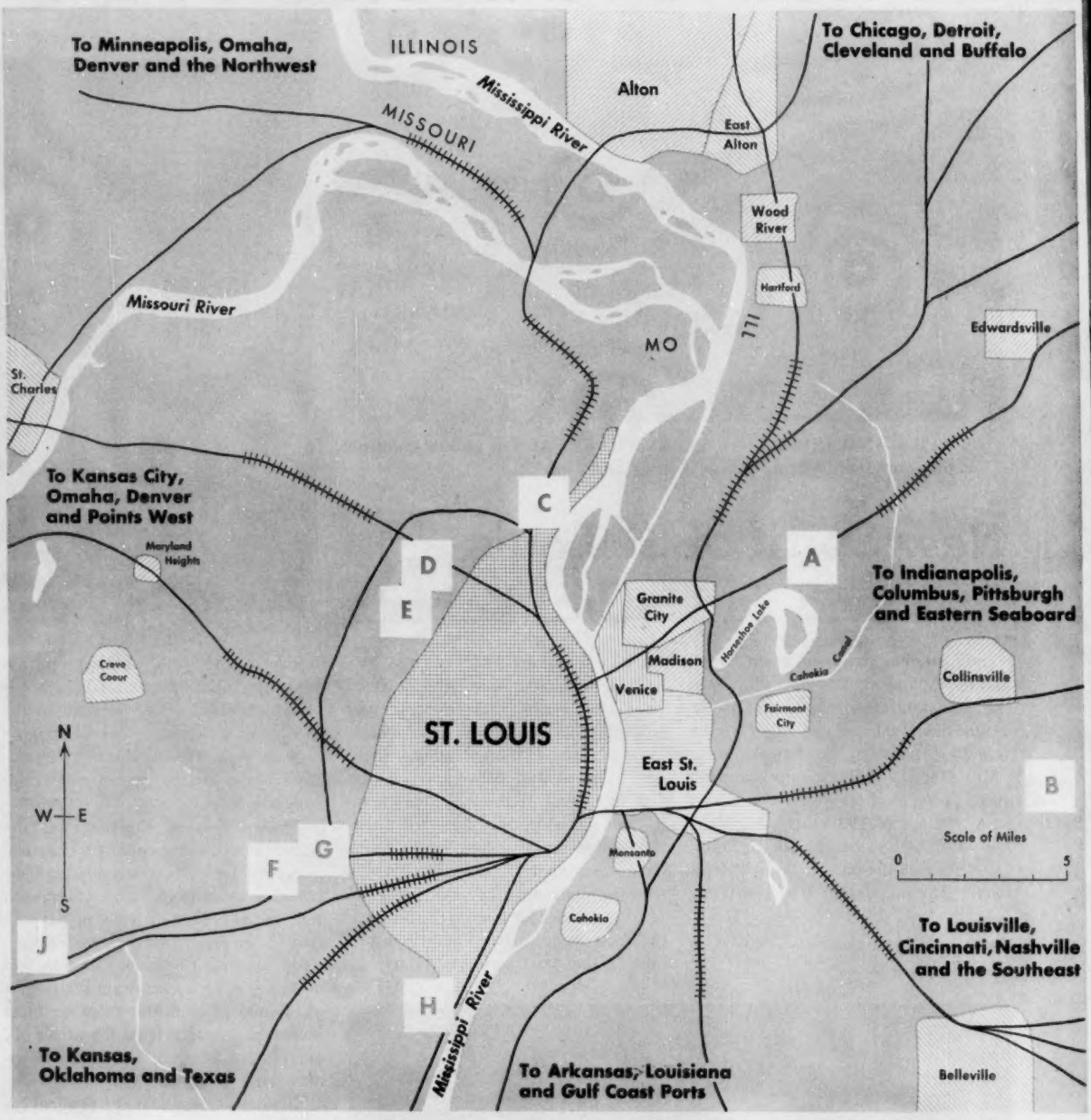
More Chemical Capacity: At the same time, the community's chemical concerns are adding steadily to their production capacity here. Monsanto has started building a 400-ton/day sulfuric acid plant, and next month Allied's General Chemical Division will complete a 35% expansion of its East St. Louis, Ill., sulfuric plant to meet increased demands from the area's oil, aluminum, detergent and fertilizer industries.

Stauffer's Consolidated Chemical Industries is building a new barge landing at its Wood River, Ill., sulfuric acid terminal, and—reportedly—has been contemplating an acid-producing plant in that vicinity. Also at Wood River, Shell Oil is building a new research laboratory.

Among process companies in the St. Louis area, Missouri Portland Cement will add 500,000-bbls./year capacity and Alpha Portland Cement will add 700,000, bringing total annual cement capacity for the area up to 7.5 million bbls. Socony-Mobil is building a $5-million catalytic cracking unit in East



SMELTING IN THE SUBURBS: At Fairmont City, American Zinc's plant.



St. Louis; General Printing Ink is erecting a new plant there. Glidden is adding to its paint plant in St. Louis; St. Louis Ordnance Plant will build a $2-million lead styphnate and tetracene plant and will spend $4 million revamping its explosives area.

Two-Year Outlook: Still more expansion plans are already in the works for this year and next. Dow Chemical —now represented in the St. Louis area by its big magnesium installation at Madison, Ill.—is ready to go on a $1-million Styrofoam manufacturing plant at Riverside, Mo.; and there'll be plenty of room left at that waterfront site for other facilities.

Air Reduction will construct a new industrial gases plant at Alton, Ill., upstream from its present plant in Madison. The U. S. Atomic Energy Commission will put a $6.5-million addition on its $17-million, Mallinckrodt-operated installation in St. Louis and will build a $33.3-million plant at nearby Weldon Springs, Mo.—also to be operated by Mallinckrodt, starting in mid-'57.

All this activity comes on top of a seven-year expansion period that saw 34 new chemical process plants come into being in this area, supplementing the $400 million worth of facilities already there in 1947. Capital expenditures for the two years 1953 and '54: chemical process plants, $72 million; oil refineries, $80 million. Largest chemical plant completed last year:

(*Continued on p. 38*)

WHERE BIG RIVERS MEET: CHEMICAL WHO'S WHO

(Major chemical producers in St. Louis and vicinity)

MISSOURI

Creve Coeur

Planetary Chemical Co. (fertilizers, insecticides)

Maryland Heights

California Spray Chemical Corp. (insecticides, fungicides)
M.F.A. Plant Foods Division (fertilizer)

St. Louis

Acetylene Gas Co. (acetylene, oxygen)
Anheuser-Busch, Inc. (dextrin, vitamins)
Arabol Mfg. Co. (adhesives, resin emulsions)
Barrett Division, Allied Chemical & Dye Corp. (ammonia, coal tars)
Blanton Co. (soybean and vegetable oils)
Braznell Co. (inks, protective coatings)
Cardox Corp. (carbon dioxide)
Cole Chemical Co. (pharmaceuticals)
Consolidated Laboratories (insecticides, germicides)
Consumers Glue Co. (adhesives)
Dennis Chemical Co. (adhesives, solvents)
E. I. du Pont de Nemours & Co. (ammonia)
Dykem Co. (dyes, food coloring)
General Printing Ink Co., division of Sun Chemical Co. (inks)
P. D. George Co. (printing ink, varnishes)
The Glidden Co. (paints, enamels)
Great Lakes Carbon Co. (coke and by-products)
Hadley Bros. Uhl Co. (vinyl plastisols and organisols)
H. V. Laboratories (germicides, fungicides)
Knapp-Monarch Co. (aerosol formulations)
Laclede Gas Co. (ammonium sulfate, aromatics)
Lange Bros. (fertilizers)
Lever Bros. (glycerine, soaps, detergents)
Lewin-Mathes Co. (copper)
Linde Air Products Co., division of Union Carbide and Carbon Corp. (acetylene, nitrogen, oxygen)
Liquid Carbonic Co. (carbon dioxide)
Lumaglow Co. (luminous pigments, protective coatings)
Mallinckrodt Chemical Works (fine and heavy chemicals)
George S. Mepham Corp. (sulfuric acid, iron oxides, barite)
Missouri-Illinois Furnaces, Inc. (ammonium sulfate, aromatics)
Missouri Paint & Varnish Co. (paints, protective coatings)
Monsanto Chemical Co.—two plants (phosphates, organic chemicals, pharmaceuticals)
National Cylinder Gas Co. (oxygen)
National Lead Co.—two plants (sulfuric acid, lead oxides, bentones, and titanium, barium and calcium pigments)
Paisley Products Co. (adhesives)
Peck's Products Co. (soaps, detergents)
Phelan-Faust Paint Mfg. Co. (adhesives, inks, paints)
Philadelphia Quartz Co. (sodium silicates)
Piatt & Smillie Chemicals, Inc. (detergents, germicides)
Procter & Gamble Co. (glycerine, soaps, detergents)
Pure Carbonic Co. (carbon dioxide)
Ralston Purina Co. (soybean oil)
Sigma Chemical Co. (organic chemicals, pharmaceuticals)
Thompson Chemical Co. (insecticides, fungicides)
James A. Varley & Sons (carbolic acid, cleaning compounds)
Vestal Laboratories, Inc. (soaps, germicides)
Warner-Jenkinson Mfg. Co. (food coloring)
West Disinfecting Co. (soaps, germicides)
Wurdack Chemical Co. (water repellents, lacquers)

Selma*

Mississippi River Chemical Co. (ammonia, ammonium nitrate)

*On Mississippi River, 35 miles south of St. Louis (not shown on map).

ILLINOIS

Alton

American Smelting & Refining Co. (lead)
Mississippi Lime Co. (lime products)

Belleville

Marsh Stencil Machine Co. (inks)

Collinsville

Chemical Pigments & Metals Co., division of The Glidden Co. (lithopone)

East Alton

Equitable Powder Mfg. Co. (explosives)
Western Cartridge Co. (explosives)

East St. Louis

Aluminum Ore Co., subsidiary of Aluminum Co. of America (aluminas, fluorine compounds)
American Agricultural Chemical Co. (fertilizer, sulfuric acid)
Armour & Co. (fertilizer, sulfuric acid)
Colchester Processing Co. (soybean oil)
General Chemical Division, Allied Chemical & Dye Corp. (sulfuric acid, aluminum sulfates)
Illinois Farm Supply Co. (fertilizer)
Koppers Co. (ammonium sulfate, coal tars)
Morris Paint & Varnish Co. (paints, protective coatings)
Steelcote Mfg. Co. (paints)
Swift & Co.—two plants (adhesives, fertilizers)
Virginia-Carolina Chemical Corp. (fertilizers)
C. K. Williams & Co. (barite)

Fairmont City

American Zinc Co. of Illinois (zinc, zinc salts, germanium, gallium, cadmium)

Granite City

Linde Air Products Co., division of Union Carbide and Carbon Corp. (acetylene, nitrogen, oxygen)
Reilly Tar & Chemical Co. (naphthalene, coal tars)

Madison

Air Reduction Sales Co. (acetylene, nitrogen, oxygen)
Columbia Quarries Co. (lime products)
Dow Chemical Co. (magnesium extrusion)

Monsanto

American Zinc Co. of Illinois (zinc, lead, sulfuric acid)
Darling & Co. (fertilizer, sulfuric acid)
Lewin-Mathes Co. (copper)
Monsanto Chemical Co. (heavy chemicals)

Wood River

Indoil Chemical Co. (petrochemicals)
Shell Chemical Co. (petrochemicals)

RURAL SITES

Illinois

A— Smith Rowland Co. (nitrogenous tankage)
B— Independent Engineering Co., Inc. (acetylene, nitrogen, oxygen)

Missouri

C— Missouri Portland Cement Co. (cement)
D— Glen Park Glencoe Lime Co. (lime products)
E— Reardon Co. (paints, adhesives)
F— Tretolite Co., division of Petrolite Corp. (additives, emulsifiers, demulsifiers)
G— St. Louis Laboratories (biochemicals)
H— Alpha Portland Cement Co. (cement)
J— Price Varnish Co. (varnishes)



MONSANTO, EAST AND WEST: On opposite sides of big river, W. G. Krummrich and John F. Queeny plants.

the $15-million, 200-ton/day ammonia plant built at Selma, Mo., by Mississippi River Chemical Corp. (subsidiary of Mississippi River Fuel Co.).

Toward Rural Settings: This kind of growth seems destined to continue, but—as is usually the case in densely populated areas—the trend is toward the surrounding countryside, where there's more elbowroom. Monsanto, for example, has acquired a 252-acre tract in St. Louis County—conveniently near the St. Louis Municipal Airport, about 10 miles northwest of the city—for the new headquarters buildings mentioned above. This move was decided on after Monsanto's 1954 reorganization brought some 250 field executives into the home offices.

Among successful and surviving chemical enterprises, first on the St. Louis scene was the fine chemicals plant set up by the Mallinckrodt brothers in 1867. Monsanto came along in 1901, Aluminum Ore Co. in 1902, and the Blanton Co. in '04. One spurt stemmed from the loss of German chemical imports caused by World War I; and the second surge has been in the decade since World War II. Total expansion of all St. Louis industries since 1946: $1.2 billion, with some 350 new plants and a nearly 25,000 upturn in industrial employment.

Obviously, St. Louis must have something to attract this array of industry. One asset: the local market, with 4.8 million people within 150 miles and 22.6 million within 300 miles. The raw materials situation is spotty; one strong point is argicultural materials—there are 43 meat packers in the area, and 12 rendering companies turn out quantities of tallow. Freight rates—both rail and river-wise—are economical for some products, won't work out for others.

But St. Louis—which now claims to be ninth largest manufacturing center in the U. S.—has a highly diversified industrial makeup: no industry employs more than 8% of the local labor force. This makes for stability—a big factor for the more than 300 compounders and blenders that are in the chemical business on a smaller scale in the area.

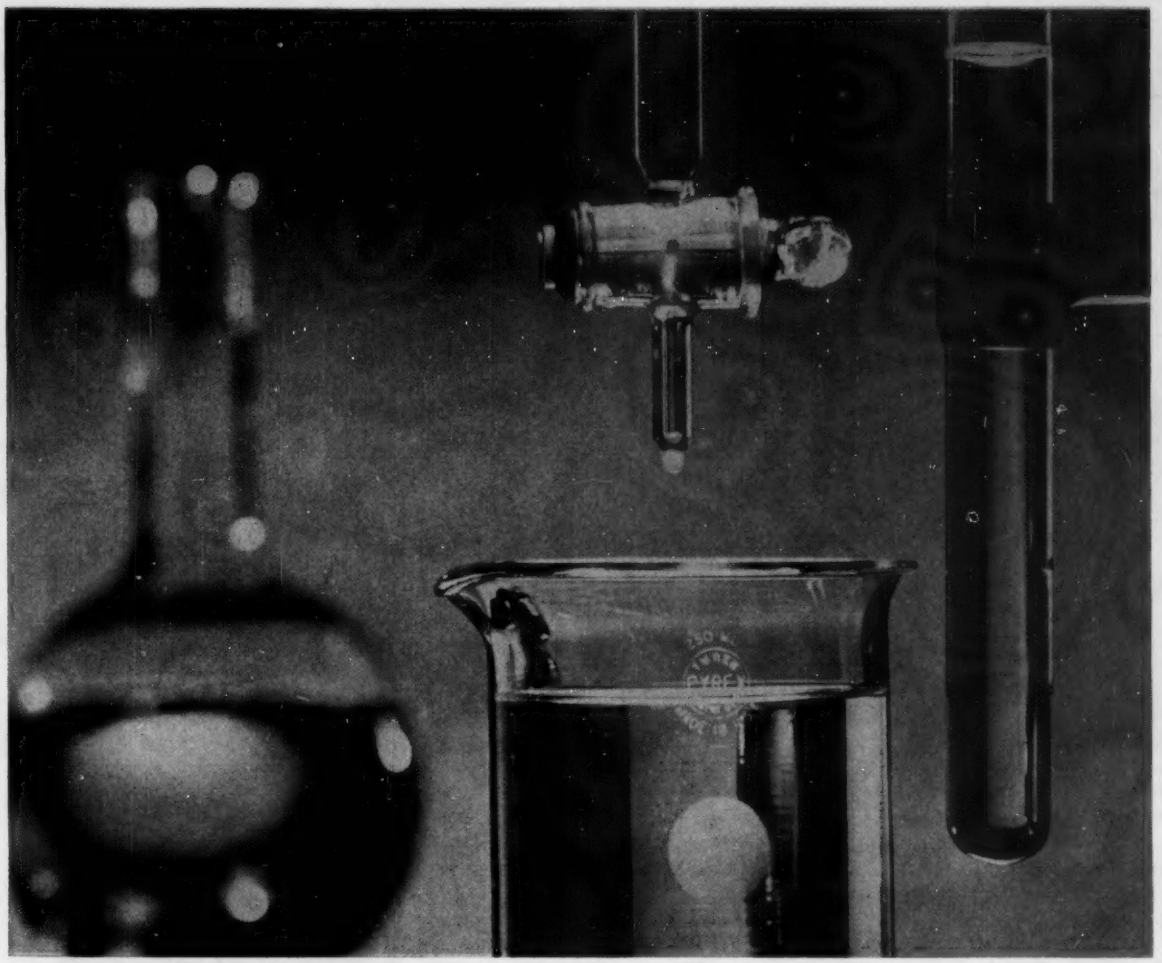
That industrial stability, plus the city and farm markets, the raw materials, plant sites, shipping and civic improvement programs, appears to be enough to draw in much more industry. Both the big utilities there are betting on this: Laclede Gas Co. is rounding out a $45 million expansion program, and Union Electric Co.—having increased its capacity 70% since 1946—is putting another $232 million into generating and transmission facilities now.





UPSTREAM AND DOWNSTREAM: At Madison, Dow (magnesium); at Selma, Mississippi River Chemical (ammonia).

DOW



The important test. Titration tests, like the one above, are used consistently at Dow to determine the assay of Dow 3-methyl-1-phenyl-5-pyrazolone. To meet their extremely rigid quality standards, it must be at least 99% pure—and Dow guarantees it!

Titration Tests assure better Dyestuffs!



Only the best will do! Fine fabrics deserve top-quality dyestuffs—the kind you can achieve by using Dow 3-methyl-1-phenyl-5-pyrazolone.

ONE MORE REASON YOU CAN BE *SURE* OF

DOW 3-METHYL-1-PHENYL-5-PYRAZOLONE

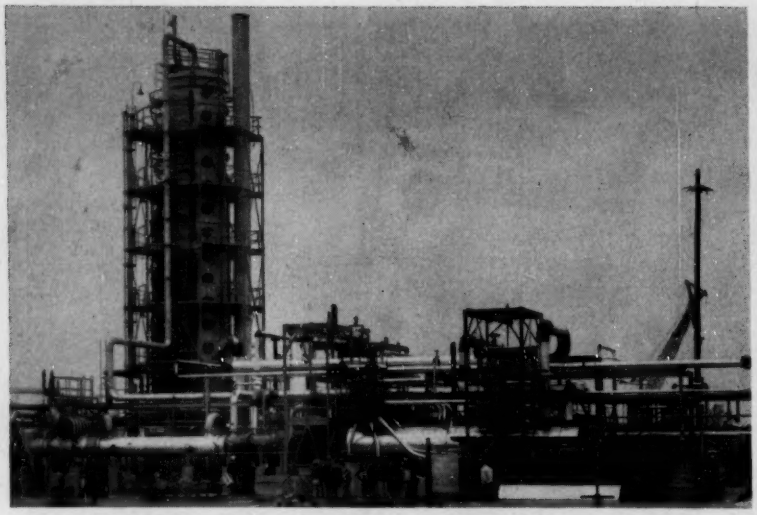
Here's a reassuring fact: Dow 3-methyl-1-phenyl-5-pyrazolone is guaranteed by Dow to be at least 99% pure—and for good reason. The reason? So you can have absolute confidence in this valuable intermediate for the manufacture of high-quality dyestuffs.

As an integral part of the Dow strict quality control, the purity of this important intermediate is determined by titration. It has to be 99% pure or it will never be shipped from the plant.

For dyestuffs or Dow pharmaceuticals —you *know* you can depend on the unvarying high quality of Dow 3-methyl-1-phenyl-5-pyrazolone. Supply? You can depend on that, too. And your order will be filled promptly.

Send for an experimental sample. Your own evaluation will convince you. THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. FC 880B.

you can depend on DOW CHEMICALS DOW



ESCAMBIA BAY: Florida's only ammonia producer, this company's pushing . . .

From Here to Identity

A company with very little past but with concrete plans for a very large future—that's Escambia Bay Chemical Corp. (Cambridge, Mass.), whose 18-month existence has seen these attainments in its fast-paced drive for identity:

- A $20-million nitrogen plant—dedicated last week—at Escambia Bay, Fla., 20 miles northeast of Pensacola, in full production.
- A 30-million lbs./year polyvinyl chloride plant ready for construction adjacent to the nitrogen operation; it will cost $4 million.
- Numerous petrochemical products and processes—covered by 90 patent applications—ready to be exploited.
- A 50% interest in Selfco (Albany, Ga.), an agricultural chemical distributor in the southeast (bought from Chemical Enterprises, Inc., see p. 52).

Escambia was off to a running start practically from the moment it was formed in Oct. '54. Jointly owned by the United Gas Corp. (Shreveport, La.), Electric Bond and Share Co. (New York), and National Research Corp. (Cambridge), it's the natural outgrowth of UGC's vision of putting its natural gas into chemical form. By agreement in 1948, the three firms started working independently toward the goal of forming Escambia.

In 1955, the three owners invested $16,940,000 in Escambia, are scheduled to put another $5,060,000 in the kitty for 1956. How this schedule holds up depends in part on utilization of the backlog of products and processes. Today UGC and Ebasco own 45% each of the company, National the other 10%. National, however, has the option of doubling its interest.

In ammonia (200 tons/day), nitric acid (220 tons/day) and ammonium nitrate (275 tons/day solution; 350 tons/day pebbled), Escambia has what it thinks are sound openers for the chemical game. They offer prime opportunities for setting up going operations with ample room for research in petrochemicals generally, methane derivatives specifically.

How It Happened: This ready-to-go situation stems from three factors inherent in the owner-management relationship: (1) UGC owns and operates substantial natural gas sources, wants to put them into chemicals; (2) Ebasco is willing to back, with UGC, embryonic development with plenty of financing, has ready experience in tax matters, engineering, distribution; (3) National has a highly trained technical management, is experienced in research that pays off.

Managerially, Escambia's future lies largely with its seven-man board, representing UGC, Ebasco and National, respectively, in a 3-2-2 relationship.



ESCAMBIA'S DONALD: From research to production, to expansion, to new products; in 18 months.

HIGHLIGHTS OF ESCAMBIA'S 18-MONTH GROWTH

- Incorporation (first as Gulf Chemical, then as Escambia)—Oct. '54
- Nitrogen production—Dec. '55—$20-million investment
- Expansion with PVC—onstream '56—$4-million investment
- Pilot plant, acrylonitrile—'56
- 90 patent applications on natural gas products, process improvements
- Nearly developed operating, research and sales staffs.



Our Technical Service Laboratory Will Help You Build Better Products With Neville Resins

Neville Coumarone-Indene Resins have long been firmly established in the formulae for a wide range of products in the mastic floor tile, rubber, and paint industries and many others. They assist in the manufacture of better-looking, longer-wearing merchandise. Throughout the years, Neville has developed many variations of these versatile resins and has conducted constant research to adapt them to new employment. If your products are conceivably applicable, why not call upon our Technical Service Laboratory to assist your chemists in investigating their profitable use. Use the coupon below to write for further information.

Neville Chemical Company • Pittsburgh 25, Pa.

Resins—Coumarone-Indene, Heat Reactive, Phenol Modified Coumarone-Indene, Petroleum, Alkylated Phenol • **Oils**—Shingle Stain, Neutral, Plasticizing, Rubber Reclaiming • **Solvents**—2-50 W Hi-Flash, Wire Enamel Thinners.

NEVILLE

Please send further information on Neville Chemicals.

NAME TITLE

COMPANY

ADDRESS

CITY STATE

NC11-CE

As administrative chief, the board chose National's Vice-President Kenneth Donald, a man experienced in marketing, engineering, accounting and research.

UGC is well represented in other top administrative posts, but Escambia points out that with growth, officers will more than likely divest themselves of dual roles. Even now the company is bringing in Robert Haslanger (formerly of Stauffer) as full-time vice-president and general manager.

Where From Here: Big job at Escambia now is staff building, well under way with the operating staff in Florida, and a well-established research team administered by Nat C. Robertson, former director of National's Petrochemical Division (initiated, incidentally, in 1948). Soon, Robertson hopes to launch into exploiting some of his already-proved research notions. Likely targets:

- Acrylonitrile (already in pilot plant with probable production of 25 million lbs./year).
- Methyl methacrylate.
- Propylene derivatives.
- Synthetic rubber intermediates.
- Plastics intermediates: epoxies, alkyds, polyesters.

To Escambia people, the future looks rosy indeed. With production up to capacity in less than a year, investments up to $24 million in two years, and a backlog of ready-to-go ideas in the hopper, it's small wonder a booming future is on every Escambian mind.



WIDE WORLD

RESEARCHER ROBERTSON: Patent applications by the week.

Clean or Empty

In defending a chemical patent, you have to come into court with clean hands or you'll walk out empty-handed.

That's the upshot of the recent decision by Judge Henry Hastie of the U.S. Court of Appeals at Philadelphia in the dispute between Metals Disintegrating Co. (Elizabeth, N. J.) and Reynolds Metals Co. (Richmond, Va.) over a patent on leafing aluminum paste pigments.

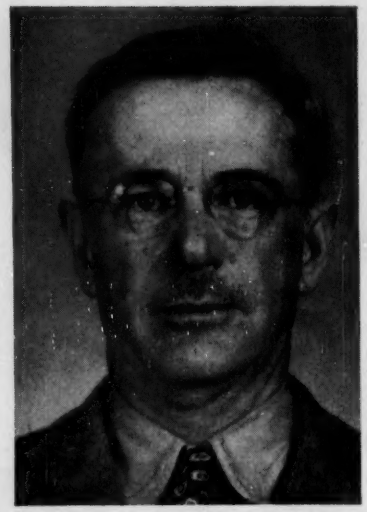
In this particular case, the court found that Metals Disintegrating's hands were clean enough and that this company should be entitled to judgment for damages. But the judge specified that damages should be computed only back to April 2, 1947—by which date the company's hands had become fully sanitary to the court's satisfaction.

Royalty Suit Failed: These two companies clashed once before over that same patent; then, Reynolds' bid to recover past royalty payments was denied. The ruling in that action was based on the court's conclusion that both parties had collaborated in inserting a price-fixing provision in their licensing agreement; and under New Jersey law, "the courts will not assist either party to an illegal contract, but will leave them where it finds them."

Later, Metals Disintegrating filed the patent infringement suit, and its lawyers anticipated that Reynolds' defense might be based on that same general legal principle. Accordingly, they took care to point out to the court that any illegal effects of the old agreement had been "completely dissipated for some time so that neither of the parties, nor the public, is now damaged thereby."

The circuit court accepted this argument, relying on a 1942 U.S. Supreme Court decision in the Morton Salt case that the courts should not entertain an infringement suit involving an illegal contract "until the improper practice has been abandoned and the consequences of the misuse of the patent have been dissipated."

In the Morton Case, the high court held that equity does not demand that a complaining party must have led a "blameless life," but that additional considerations must be taken into account when a suit concerns some public interest.



EXAMINER LIPSCOMB: For drug suppliers, no more brokerage fees.

LEGAL

No More Brokerage: Despite Congressional fire on recent interpretations by the courts and the Federal Trade Commission on brokerage provisions in the Robinson-Patman Act, precedent has been upheld in a cease-and-desist order against the Druggists' Supply Corp. (New York) and its drug company owners. Hearing Examiner Abner Lipscomb told the company and its owners to stop giving or receiving brokerage fees on purchases made by or for the firms. The order was made after the 14 defendants entered consent decrees, and the hearing was started a few weeks before Druggists' Supply was scheduled to dissolve. One of the defendants, Smith, Kline & French, Inc. (Philadelphia), was dismissed from the charge that it had received brokerage compensations from the supply firm. As of Jan. 1, the functions of Druggists' Supply have been taken over by D. S. C., Inc., a supply corporation formed on a nonprofit basis.

•

Reaching Out: The ubiquitous chemical industry, building more and more plants in less-populated areas, is watching closely a suit protesting municipal annexation filed by the Ford Motor Co. in Jefferson County circuit court, in Kentucky. A recent Louisville ordinance would permit the city to annex the Ford operation on a spot annexation or corridor basis,

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insecticides and mothproofing compounds; and agents that speed rubber vulcanization without scorching;



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IN CANADA: NORTH AMERICAN CYANAMID LIMITED, TORONTO AND MONTREAL

wherein the city would reach out to envelop — and tax — a particular industry. Near Buechel, Ky., General Electric Co. is fighting the same principle on the basis that it is an out-and-out tax gambit on the city's part. Ford argues that the proposed annexation is "an illogical piecemeal inclusion within boundaries of an arbitrarily described area that has no reasonable relation to the growth of the city or relationship of such area to other areas similarly situated."

•

No Pollution Guilt: A decision indicating that conviction on charges of stream pollution must be accompanied by proof of deliberate or malicious intent has been handed down in Texas. The question arose when a justice of the peace at Baytown, Tex., found the plant manager of Nyotex Chemicals, Inc. (Baytown) guilty of stream pollution. An appeal was tried in county court, Houston, resulting in a ruling by Judge William Miller, Jr., that since there was a closed gate on the waste disposal pond, indicating an attempt to prevent the escape of waste, there was no deliberate or malicious attempt to pollute.

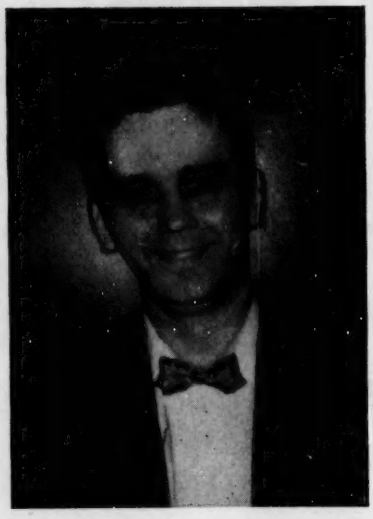
LABOR . . . . . .

Off to Early Start: Just as the AFL-CIO's Committee on Political Education is launching "a vigorous campaign" to raise funds for the general election campaigning this year, the one-year-old Oil, Chemical & Atomic Workers Union (AFL-CIO) is taking its first step into the political arena.

At Washington's Woodner Hotel next week, delegates from OCAW's locals and district councils will hold a two-day legislative conference that's being arranged by Jack Curran, vice-president and Washington representative for the union.

Problems facing Congress this year, Curran says, "are bread-and-butter issues that will affect family and community life of OCAW members. . . . The extent to which these problems are solved in our favor depends in large measure on the informed efforts of our membership in making their views known to the Congress."

AFL-CIO President George Meany —doubling as chairman of the federation's Committee on Political Education, which is to be known as COPE —has told the group that increased political activity this year is necessary "to protect the very existence of our trade union movement."



OCAW'S CURRAN: At next week's meeting, a start on union's politicking.

•

Picketing Permitted: Out at Wendover, Utah, the potash plant of Bonneville, Ltd., remains bottled up by a strike on which the state supreme court has now taken a "hands off" stand. Specifically, the court refused to grant an injunction against District 50, United Mine Workers, which has been on strike at the Wendover works nearly five months (*CW, Dec. 10, '55, p. 19*).

However, the state supreme court's ruling has no direct bearing on other aspects of a suit being pressed by the company in a local court to test the state's new "right to work" law. In this suit, Bonneville is asking judgment for $350,000 as damages for alleged illegal picketing, strike and violence at the firm's solar evaporation unit near the Utah-Nevada boundary line. The higher court's ruling means that there'll be no temporary injunction against picketing while the suit is pending.

District 50 seeks recognition as exclusive bargaining agent at the plant. Bonneville not only charges the union with violation of the right-to-work law, but also contends it can't sign a labor agreement with a union whose officers haven't signed non-Communist affidavits as provided in the Taft-Hartley Act, and asserts that when the strike began, it already had a valid contract with a union certified by the National Labor Relations Board.

•

Floating Holidays: In addition to vacations and fixed holidays, employees of Abbott Laboratories (North Chicago, Ill.) will now get three "floating" holidays each year. Each worker may—with his supervisor's approval —take these extra paid holidays for such occasions as family birthdays or as extensions to vacations.

KEY CHANGES . . .

Howard G. Oster, to vice-president, Eaton Chemical and Dyestuff Co. (Detroit).

Robert V. Haslanger, to executive vice-president, Escambia Bay Chemical Corp. (Cambridge, Mass.) (*see p. 40*).

Paul E. Tillman, to senior vice-president, and **Daniel C. Searle,** to secretary, G. D. Searle & Co. (Chicago).

Emil R. Albert, Jr., to president and general manager, Rubarite, Inc. (Chicago).

J. Philip Smith, to general manager, chemical sales division, Chas. Pfizer & Co., Inc. (New York).

John Paul Jones, to assistant to the president, Victor Chemical Works (Chicago).

George V. Du Pont, to general manager, Diamond Black Leaf Co. (Cleveland).

George F. Klein, Jr., to vice-president and director, Catalytic Construction Co. (Philadelphia).

C. L. Barksdale, to vice-president, Calgon, Inc. (Pittsburgh).

Richard J. Coveney, to vice-president, Arthur D. Little, Inc. (Cambridge, Mass.).

James P. Lockwood, to treasurer, Petro-Tex Chemical Corp. (Houston).

DIED . . . . . .

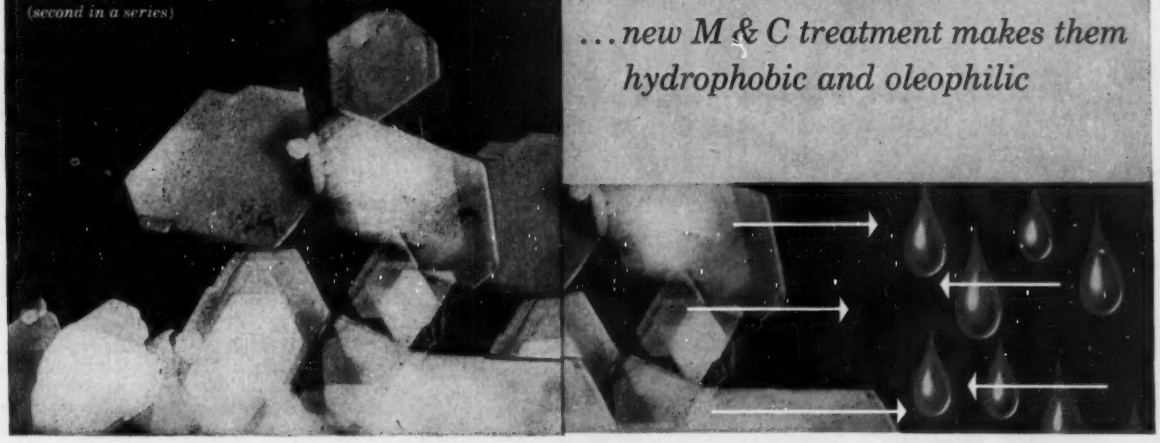
William T. Haebler, 55, vice-president, treasurer, and director, van Ameringen-Haebler, Inc. (New York), at West Palm Beach, Fla.

Robert M. Hillas, 71, board chairman, Columbian Carbon Co. (New York), at Belleair, Fla.

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(second in a series)

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. . . new M & C treatment makes them hydrophobic and oleophilic



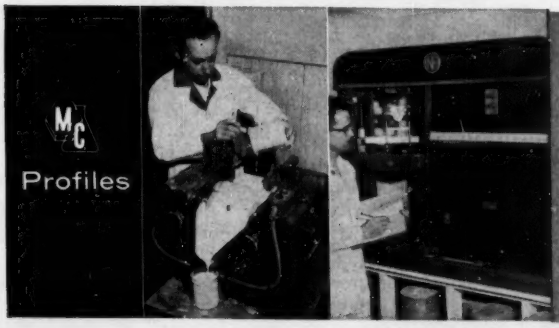
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In special sections at Minerals Research Center, oleophilic kaolins are put through their paces. (*left*) In an organic paint system made in this miniature 3-roll mill, the material showed splendid wetout, low grinding time, high pigment loadings; (*right*) molded plastic made with the new material is tested for transverse breaking strength . . . more reasons to

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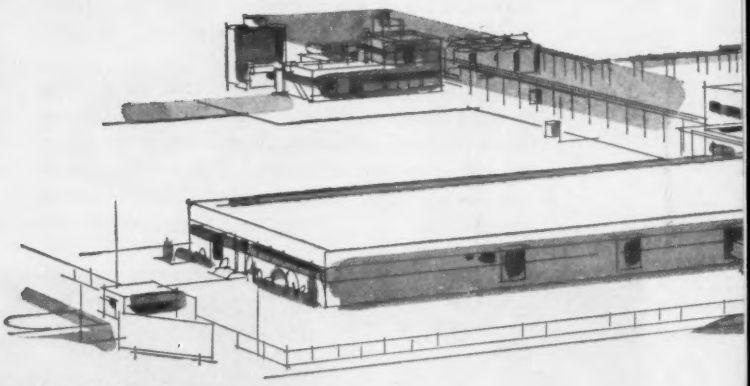
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COST PROBLEMS?

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Armour cationics reduce water flood corrosion up to 99.5% and give complete control of bacteria—for as low as 0.7 mill per barrel of water

In secondary oil recovery, water is injected into the formations to force out the oil. Corrosion products—bacteria, and algae—often plug up water injection wells. As a result, less water can be injected and less oil is recovered. Now, engineers from over 124 water flood systems in eight states report that Armour cationics, such as the Arquads®, Armac®C and Duomeen®C give up to 99.5% corrosion protection. Concentrations as low as 6 ppm. also achieve *complete* control of algae and bacteria. Costs run from 0.7 to 2.1 mills per barrel of water. No expensive equipment needed!

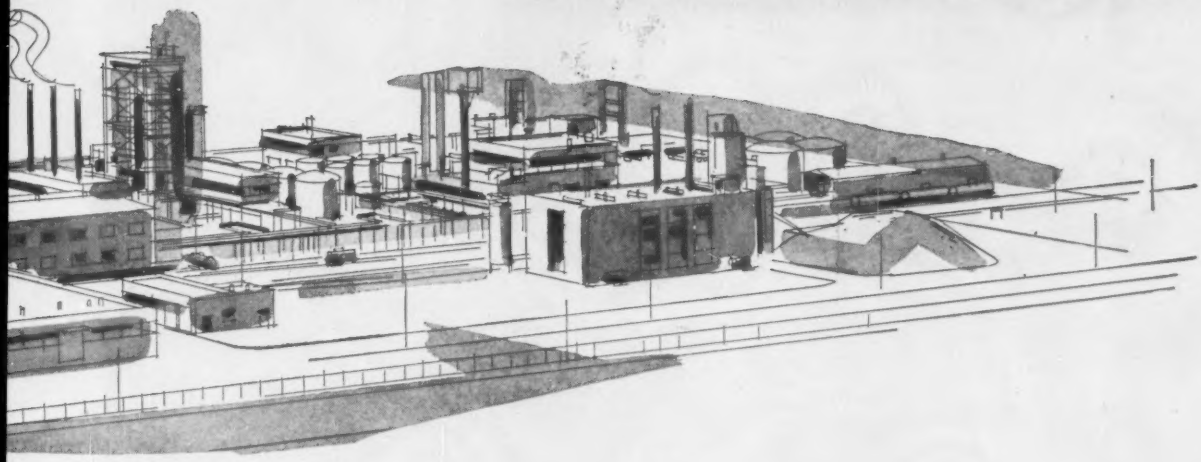
Armour makes over 100 cationics. Corrosion and bacteria control are only two of over 1000 applications. Effective at low concentrations, they are increasing production and profits for a broad range of American industries.

Storage and field tests prove Armour herbicide emulsifiers give stability and flash dispersion—for as little as 7¢ per gallon of concentrate

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Whether you are looking for a low cost herbicide emulsifier or working on cost reduction in some other application, you may very well find the answer in Armour's wide range of cationic chemicals. They are reducing costs in more than 1000 known applications.





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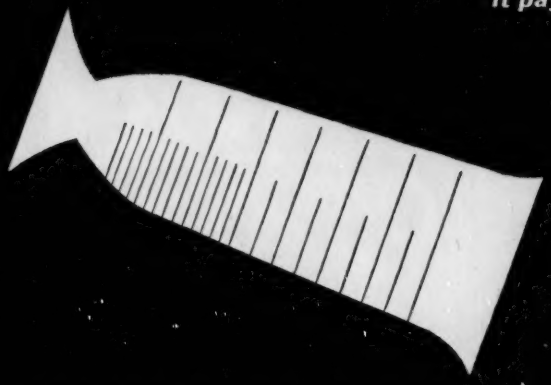
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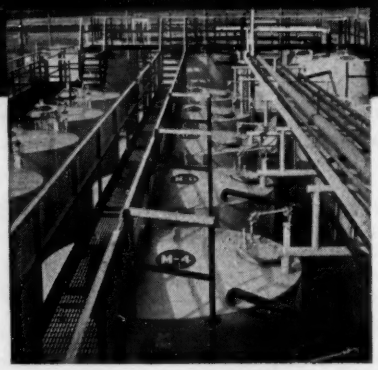
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PROPOSING: At CSC symposium, Armour Chemical's Shapiro poses one aspect of nitroparaffin chemistry.

CONSIDERING: Scientist audience probes ways for personal application.



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- **Here's rundown on who is doing what, how and where in . . .**

Symposiums: Stimulus to Development

Things are happening to the symposium, that old stand-by of college education. It's being transferred from staid campus lecture halls to the ballrooms of midtown hotels and injected with a dash of theatrics. And this is instrumental in the symposium idea's new emergence as a valuable tool for commercial chemical development.

In San Francisco, less than a fortnight ago, for example, Commercial Solvents staged its third symposium on nitroparaffins in four months. They've been so successful that the company will likely add Boston, Atlanta and Houston to the itinerary.

No less enthusiastic is Delaware Chemical. Results of its first two symposiums (held last year) were so good that the company now plans to hold at least one every year. Goodyear, another user, is also planning more.

Although not used too widely yet, this new sales and chemical commercialization tool is demonstrating versatility and excellent results at attractive costs.

CSC aimed at broadening markets by first exciting experimental interest among potential customers. The company engaged speakers with experience in applied nitroparaffin chemistry, set up the meetings, and invited key supervisory research personnel. The papers presented emphasized technology, conspicuously omitted razzle-dazzle merchandising.

Upshot of its efforts, says CSC:

- Increased awareness by industry of what its nitroparaffins do.
- General pickup in business.
- More leads and prospects.

Delaware's venture, too, yielded good results. Delaware, a small company, used the symposium to convince customers that it is a reliable pentaerythritol supplier. The outgrowth: salesmen found accounts noticeably more willing to purchase its wares.

Cost: Benefits carry modest prices. Delaware's bill (with meal) was $10-15/guest, excluding services of company personnel, while Commercial Solvents lunched 160 in New York, picked up a tab of $8,000 for literature, rental, meals and refreshments, speaker expenses. The Chicago meeting bill was about $4,000 for 175 people (nonrecurring costs—slides, literature—were charged to the New York show).

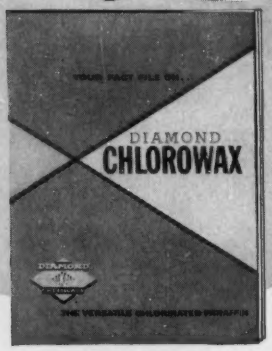
What to Expect: Favorable reaction and modest costs are only part of CSC's and Delaware's experience with the symposium technique. They've also found that a chemical company must plan carefully if it's to produce a successful "class."

First step is decision on prime objectives. While CSC's main purpose was sales development, it also strove

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Check list for Symposium Selling

DO	DON'T
√ . . . include plenty of technical information	√ . . . make an overt advertising stunt of the meeting
√ . . . have enough technical personnel on hand to answer queries, serve as hosts	√ . . . have too large an audience —there's danger of losing the personal touch
√ . . . start planning far in advance	√ . . . try a symposium too early in a product's development— you must have something to talk about
√ . . . have as many outside speakers as possible	√ . . . try to cover everything— limited subject area allows depth presentation

to build prestige and recognition of companies now using nitroparaffins and to boost interest in commercial chemical development through college programs. Worth noting: both CSC and Delaware stressed only one chief goal.

Lining up the speakers to carry out the program is about the toughest part of running a symposium. Understandably, experts not connected with the sponsoring firm are most desirable. But getting them is difficult. Manufacturing consumers are reluctant to part with know-how of potential value to competitors. In fact, only one out of 10 "outsiders" accepted CSC's invitation to speak. The only inducement that could be offered: prestige, learning about other uses of the compounds.

CSC suggested topics, assisted in preparing color slides and visual aids. Objectivity was the watchword; lecturers were free to include unfavorable as well as favorable data in the talks.

Advance planning, another key part of symposium staging, began eight weeks before CSC's New York session, six weeks before the Chicago meeting.

Invitations were sent to some 1,200 people in the New York area, 600 around Chicago, and 750 in the San Francisco district. Radius of invitation: 150 miles. (Delaware's was 300 miles.) About 160 accepted CSC's invitation in New York, 175 in Chicago, and 126 on the West Coast. By design, the audiences were chiefly technical men. Others, however, including some purchasing agents, also attended. Several CSC representatives circulated during the refreshment periods, and answered spot questions.

Audience attention figured in CSC's design. Topics were keyed to industries in the area. Color slides replaced traditional black and white slides. The stage was brightly lighted. Visuals were carefully planned to be seen by all. Attenders were provided with pads for note-taking, literature, and a plastic zippered case in which to carry home the material. Nearly all used the pads, and, says CSC, "no literature was thrown on the floor."

Follow-Up: To retain interest generated at the sessions, CSC is sending "thank you" letters, new literature on nitroparaffin developments as they mature, and a bound book of all papers presented at the three meetings. And, of course, there'll be follow-up salesmen's calls. Whether large-scale industrial use of the symposium evolves remains to be seen. The method has its drawbacks. Example: symposiums can only be applied where there is a "bunching" of industry about a central location.

But expectations are that there'll be more and more such programs. Several firms have already queried CSC and Delaware. And, as Frank Maple, general manager of industrial sales for CSC, sums it up, the approach offers "a low-cost, effective method of reaching and developing potential customers."

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FERTILIZER DISTRIBUTION: A problem-fraught field.

Up, Down—Not Out

In late '54, CW reported the activities of a bustling three-year-old commercial fertilizer distributor, Chemical Enterprises. This week the company is again a topic of discussion among agricultural chemical sellers. Why? Despite shucking of nearly half its operating distribution stations, a shake-up in top personnel, and a growing ammonia glut (all within about a year), the company—contrary to what many believe—will stay in business.

The metamorphosis from a fast-growing, future-bright fertilizer distributing colossus to its present curtailed status has been, to say the least, dramatic. Early last year, Chemical Enterprises had 277 ammonia stations under its banner. Of these, 149 were operated by two companies in which CE owned 50% interest—Schrock Bros. (Congersville, Ill., 120 stations); Selfco (Albany, Ga., 29 stations). All other stations were wholly owned by CE.

Prospects were rosy then for future expansions through acquisition of more local operators and establishment of new units in areas not served by distributors.

Today the picture is far different. Schrock and Selfco are no longer with CE. Interest in Schrock was sold to Standard of Indiana last December. The latter will use Schrock to distribute output of Calumet Nitrogen's* new ammonia plant at Hammond, Ind. CE's Selfco interests were sold to Escambia Bay Chemicals in August. Upshot of these unloadings: CE is out of the Georgia-Florida area completely, has greatly curtailed operations in the Midwest.* The latter area is still served, however, by CE's Chemco-Radco group—30 stations in the Missouri-Iowa region.

*Standard-Sinclair joint venture.

Disposal of its Schrock and Selfco holdings doesn't mean that CE will be permanently out of the areas they served. The reason they were sold, a company spokesman tells *CW*, was "to free capital needed elsewhere." Schrock and Selfco were operating at a loss and Chemical Enterprises decided that it couldn't keep pouring money into the ventures without endangering the overall financial well-being of the company.

Selfco's financial status at the time was somewhat shaky, chiefly because of two uncontrollable factors: a late freeze in the spring and a dry season previous to that. Farmers throughout Georgia lost the bulk of their peach, pecan and tobacco crops and were too hard-pressed to buy much fertilizer.

At Schrock, conditions were a little different. Small independent distributors, seemingly skirting cost-controls, shaved anhydrous ammonia prices too close and Schrock had to follow suit. Disposal of Schrock and Selfco left CE with only its wholly owned divisions.

Along with change in CE holdings have come some major shake-ups in personnel. Daniel B. Curll resigned as president last August and the top spot went to W. S. Kies, president of a private investment trust. Main reason given by Curll for his departure: disagreement with others over the rate of expansion. Curll tells *CW* he favored a long-time growth pattern with large plow-back of profits into expanded operations. Others were reluctant to dilute stockholders' equity by issuing more stock to obtain capital necessary for expansion. There was also some feeling that Curll had paid too much for some acquisitions.

*Bulk of Schrock's operations are centered in Illinois, with anhydrous ammonia storage capacity there totaling 600,000 gal. Other Midwest facilities: Kansas, 72,000 gal.; Nebraska, 48,000; Okla., 30,000; Iowa, 90,000; Indiana, 30,000.

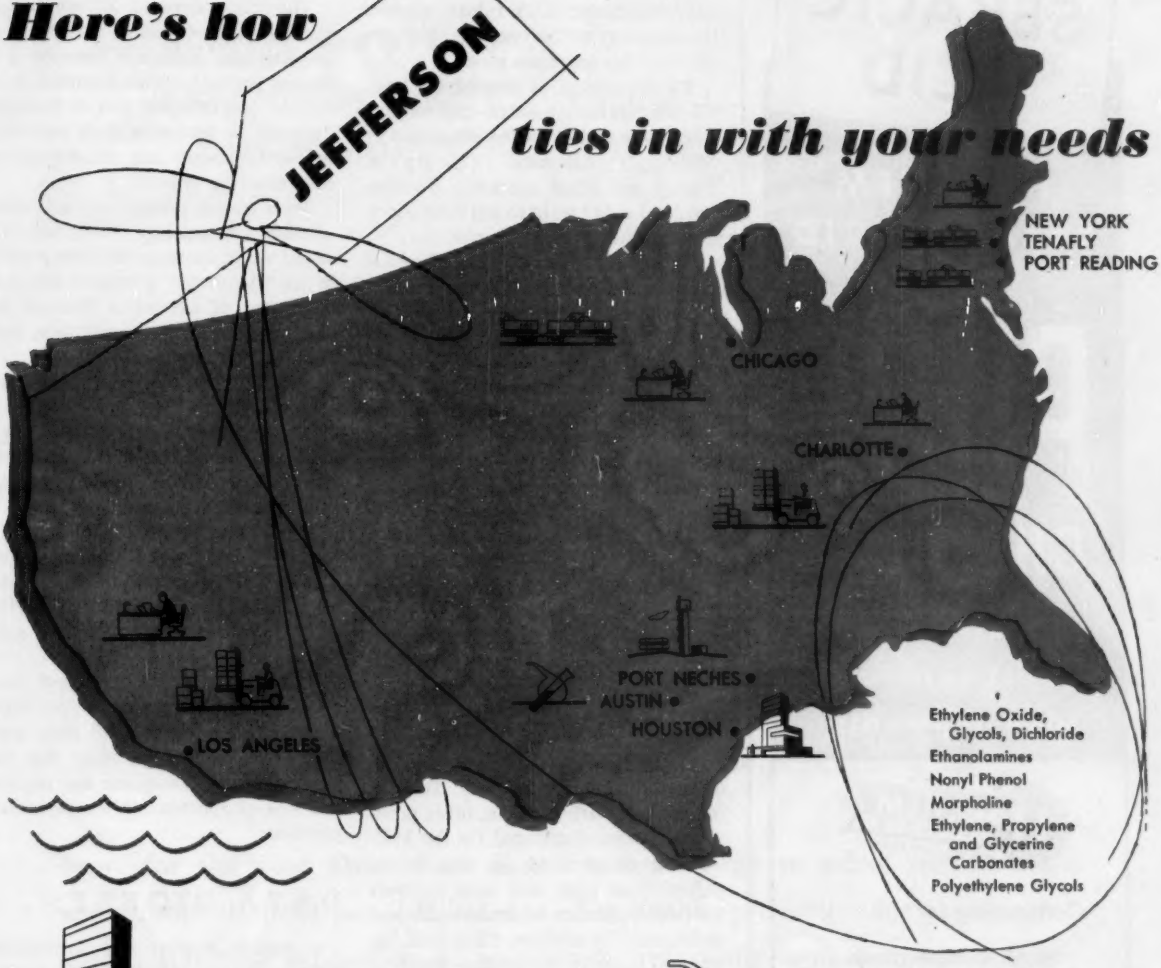
A large part of the opposition to Curll can be traced to Lee Higginson Corp., a New York underwriter and dealer in securities. Higginson was instrumental in setting up the company in Feb. '52, and is probably major stockholder in the firm, owning approximately 9% of the outstanding shares.

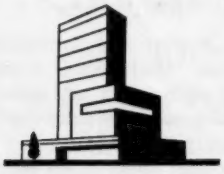
Higginson hasn't always been Johnny-on-the-spot with needed financial arrangements, however. In '54, for instance, at Curll's behest, 250,000 shares of stock were underwritten by Johnson, Lane, Space Co. and other Southern investors, after Higginson was unable to find the necessary underwriters. Higginson was originally asked by CE to find underwriters, but it ran into difficulties when commissioners of some states, faced with a new company working with a new product and having little record of demonstrated earnings, called for engineering appraisals. By the time these were ready, Higginson's prospective underwriters had cooled off. Johnson, Lane, Space, et al., profiting by Higginson-initiated appraisals, had no trouble selling all the stock in two days.

After the original underwriting was successfully completed, interest in CE developed in the New York market. Since then, much of the firm's stock has been redistributed, is now held by Northern investors, with Higginson still very much in the picture.

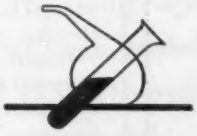
Present policy at CE seems to be one of restraint and caution. Some people believe this policy is too cautious, however, point to the failure of CE to secure two Midwest distributors as a missed opportunity. Negotiations begun by Curll for acquisition of Midwest Fertilizer (Indiana plants) and Illinois Anhydrous (Farmer City, Ill.), with estimated total yearly sales of 20,000 tons of anhydrous ammonia, were nixed by other members of the board. Neutral observers say that acquisition of these two firms would

Here's how JEFFERSON *ties in with your needs*





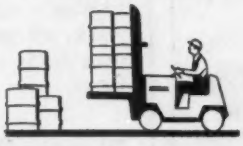
EXECUTIVE OFFICES
A fully integrated company with complete facilities strategically located to serve petrochemical users.



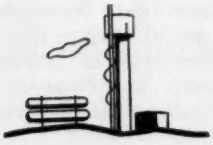
RESEARCH LABORATORY
Extensive research facilities are maintained where experienced chemists are constantly seeking new and better petrochemicals.



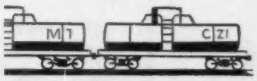
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H-9

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have brightened CE's future, allowed the company to use entire output of a 100-ton/day ammonia plant.

To this charge of missing the boat, CE officials have a simple explanation. They were outbid for the properties by Mid-South Chemical (Memphis, Tenn.) and other ammonia distributors, and didn't want to sell more stock to raise the necessary capital.

Thus, it's apparent that Chemical Enterprises, along with other fertilizer distributors, has had some rough sledding. The switch—from the bright days in '52, when distributors could sell all the anhydrous ammonia they could obtain from producers, to today's competitive market—is being felt all along the line. High maintenance expense and ever-rising replacement costs don't make things too rosy. Also more and more anhydrous ammonia is coming on the scene (U. S. capacity: 4.3 million tons this year, 4.9 in '57). With supplies plentiful, farmers are putting off buying to the last minute, shrinking an already-seasonal market.

To meet the challenge of more competition, CE is simplifying its corporate structure, subjecting administration and operating costs to close scrutiny, and consolidating operations. To level out seasonal selling peaks, other products are being distributed (in the Midwest, livestock feed; in the South, polyethylene pipe, and crop sprayers for late application of insecticides and defoliants). In addition, CE is utilizing storage facilities by leasing them to chemical companies in off seasons.

Despite the past year's setbacks, Chemical Enterprises is still optimistic and intends to stay in the fertilizer business. The company, though, is training its sights on current marketing plans, will jettison what it now feels were overly optimistic, too-long-range hopes.

Plastic Pipe Hallmark

Beginning this month, a new National Sanitation Foundation seal on plastic pipe and fittings will make it easy for health and water department officials, the public and industry, to identify plastic pipe that is free from any toxicity or effect on taste when used for drinking water systems.

The seal is an outgrowth of a three-year research program conducted jointly by NSF and members of the Society of the Plastics Industry, Inc.

The study covered 22 samples of plastic pipe—broadly classified as polyethylene, polyvinyl chloride (including saran) rubber modified polystyrene, and cellulose acetate butyrate. Purpose: to determine their suitability for underground use in conducting cold drinking water.

Tests were designed to show whether any possibly deleterious substance would be extracted from plastics by an "aggressive" potable water, and if passage of the water through the pipe would affect the appearance, taste or odor of the water.

Plants of participating pipe makers will be regularly inspected by NSF officials, and pipe produced must meet minimum established standards. These regular tests will be supplemented by surprise samplings.

Manufacturers of the plastic raw materials used in the pipe must also obtain NSF approval of their material. These producers will then certify to their customers that they have such approval.

Enthusiastic supporters expect plastic pipe manufacturers to publicize the marking program and their participation in it, feel it's likely that the public will soon recognize and require this seal of approval on the pipe they purchase.

DATA DIGEST. . .

- **Atomic energy:** new fortnightly bulletin service, "International Atomics," will contain news of atomic energy developments. Whaley-Eaton Service (Washington, D. C.).
- **Bag packing:** folder offers information on new bag packer (Auger-Matic) suitable for light, fluffy materials. E. D. Coddington Mfg. (Milwaukee).
- **Nopco Chemical Co.** (Harrison, N. J.) offers bulletin containing chemical and physical information on three materials—Nopco GS-10 (hydroxylated aliphatic amide); Nopco 1525-L (polyoxyethylene ether of alkylated phenol polymer); and Nopcoset B (anionic-type polyvinyl acetate emulsion).
- **Curing systems:** technical bulletin describes application of coprecipitate of pine wood lignin and butadiene-styrene copolymer in curing and reinforcing rubber. Polychemicals Division, West Virginia Pulp and Paper Co. (Charleston, S. C.).

NOW!

Cut down research time in formulating and processing

Presenting the PLURONIC® "GRID"

Now, for the first time, there is a systematic way to select surface-active agents with the best possible balance of desirable properties for your formulation. Random evaluation of unrelated surfactants is no longer necessary. The new Pluronic Grid, shown on the next page, makes this possible. It is both practical and easy to use . . . helps you to simplify formulation and processing . . . suggests *in advance* the characteristics you can get using a Pluronic or a combination of Pluronics.

WYANDOTTE PLURONICS ARE VERSATILE, EASY TO USE

The Pluronics are a unique series of nonionic surface-active agents which are 100% active in *all* forms—liquids of varying viscosities, pastes, flakes, powders, and cast solids.

The first commercial example of a block-polymer-type surfactant, the Pluronics offer a controlled variability and flexibility not found in other surfactants. By varying their molecular weights and hydrophilic-hydrophobic ratio in small increments, an over-all balance of desirable properties is provided: controlled sudsing, a range of surface-active properties, stability, low hygroscopicity, dedusting properties, and a low order of toxicity.

The Pluronics are easy to formulate . . . blend easily with common builders. They permit you to compound products which are completely dust-free and exceptionally free-flowing . . . products which offer desirable and distinct advantages over competition!

Turn the page—use the Pluronic Grid to save research time and achieve better results!

Choose a tailor-made surfactant

The properties you want in your product can be "made to order" by varying the molecular weight and/or the hydrophilic-hydrophobic ratio of the Pluronics. Just select the surfactant you need from the Pluronic Grid!

Pluronics different from other nonionic surfactants

Most chemists know that polyoxy*ethylene* compounds are water soluble —no matter how high their molecular weight.

For many years, it was generally assumed that polyoxy*propylene* compounds would *also* be water soluble. However, the fact is: at a molecular weight of about 800-900, polyoxypropylene compounds change—*from* water soluble *to* water insoluble.

Investigation at Wyandotte revealed that if water-soluble polyoxyethylene groups were added to both ends of the water-insoluble polyoxypropylene chain, a new series of surface-active agents would develop.

These surfactants could have a hydrophobic base of any controlled length and any hydrophilic-hydrophobic balance . . . achieved by adding amounts of ethylene oxide varying from 10% to 90% of the final molecule.

This is the basis of the Pluronics, which can be represented by the following simplified structure:

$$HO(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_cH$$

The Pluronic Grid illustrates the possible molecular range obtainable.

Molecular flexibility basis for Pluronic Grid

The Pluronic Grid offers you a wide choice of carefully controlled surface-active agents. They range in molecular weight from 1000 to over 11,000; have a controlled hydrophilic-hydrophobic balance, varying from materials that are almost water-insoluble to materials that have no cloud point—even at the boiling point of water.

How to use the Pluronic Grid

Because of the wide range of molecular weights obtainable in the Pluronics—and because of complete freedom in controlling the hydrophilic-hydrophobic balance—many properties of the Pluronics can be plotted as trends across the Grid.

By observing these trends, the formulator can select—from the Grid—the Pluronic having the best balance of properties for his particular application. After only a few laboratory tests, he can narrow this area down to the best Pluronic for his formulation.

Known trends for several general properties of the Pluronics are shown; other specific trends can be determined easily by evaluating a few Pluronics from various positions on the Grid.

Pluronic nomenclature

To simplify the naming of the Pluronics, they are identified by a letter (L, P, or F) and a two-digit number. The letter identifies the physical form of the particular Pluronic: L for liquid, P for paste, F for flake. The first digit identifies the arbitrary molecular-weight ranges of the hydrophobic base as indicated by the column to the left of the Grid. The second digit suggests the approximate percent of ethylene oxide in the total molecule.

Thus, Pluronic L64 is a liquid having a hydrophobic-base molecular weight of 1501-1800, and 40% of the total molecule is ethylene oxide.

Example I: Formulating a machine-dishwashing compound

The surface-active agent used in a machine-dishwashing compound should have the following properties: good rinsing; very low foam; good wetting; good detergency; good lime-soap-dispersing ability; good dedusting properties; extremely low toxicity.

Rather than initiate a random evaluation of all the unrelated surface-active agents now commercially available, the formulator can save research time—and direct his efforts in an organized approach to the problem of selecting a suitable detergent—by referring to the Pluronic Grid.

Very low foam is important in a machine-dishwashing compound. And it can be seen that the lowest foaming Pluronics are in the lower left quadrant of the Grid. The property trends also indicate that the best wetting and penetrating action is in the lower left quadrant . . . this area also has excellent rinsing.* The area of best detergency is in the central position of the Grid. The best lime-soap-dispersing properties are found in the upper right quadrant. The cloud point and solubility of the Pluronics increase in moving toward the right side of the Grid . . . the formulator may choose a Pluronic having any degree of solubility that is desired.

Since rinsing, foaming, and wetting are the most important properties, the formulator should evaluate Pluronic L62, L63, L42, and L43 in his particular formulation. This systematic approach to the problem can eliminate much fruitless work in unprofitable areas.

An added advantage of all the Pluronics, not indicated by the Grid, is their extremely low toxicity . . . and liquid grades give *permanent* dedusting.

* *It should be noted that L61, L31, and L81 were not considered in this application because of their relatively poor rinsing characteristics. Added in small quantities to any of the Pluronics, they will effectively suppress foam. Field tests have shown that a 1:9 ratio of L61 to L62 or L63 effectively lowers their foam without adversely affecting the rinsing characteristics.*

Turn the page for more examples...

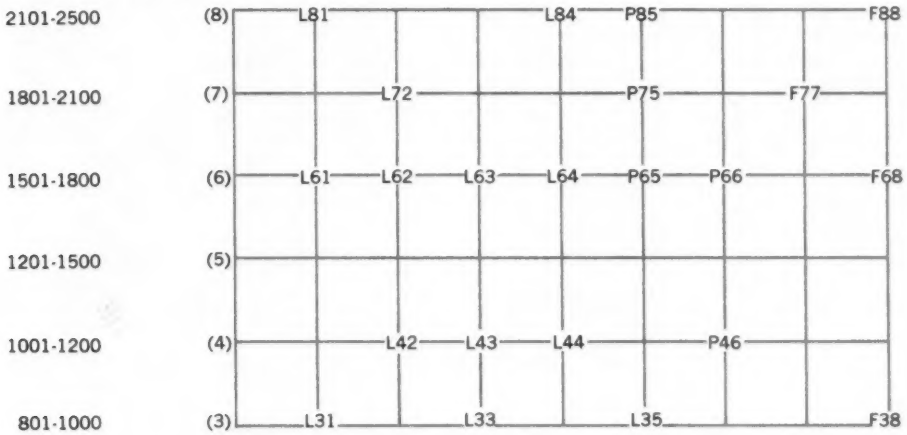
from the Pluronic Grid

PLURONIC GRID

% POLYOXYETHYLENE (HYDROPHILIC UNIT) IN TOTAL MOLECULE

(SECOND DIGIT)		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%	0	10	20	30	40	50	60	70	80

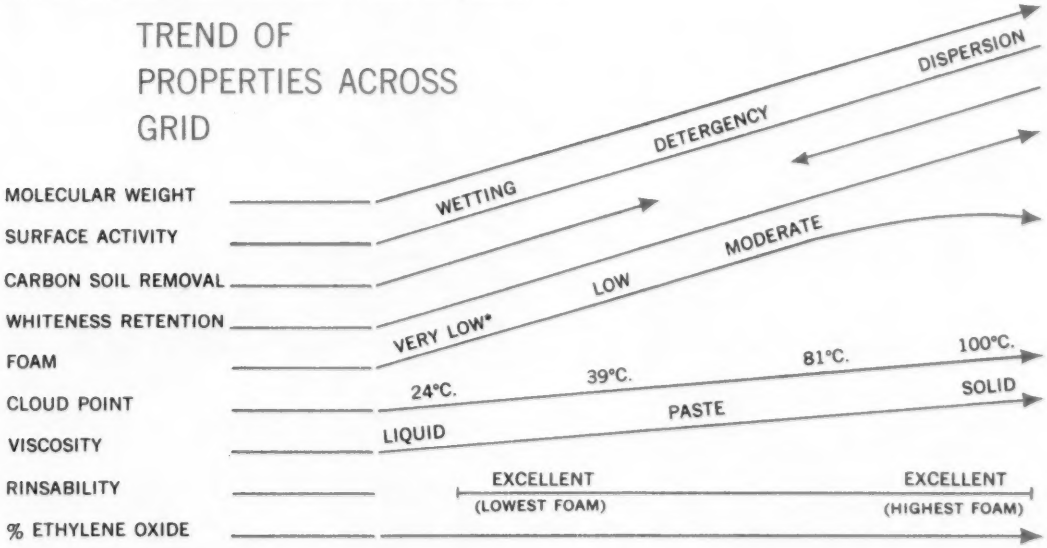
MOLECULAR WEIGHT OF POLYOXYPROPYLENE HYDROPHOBIC BASE (FIRST DIGIT)



PLURONICS L61, L62, L64, L44, P75, AND F68 ARE COMMERCIALLY AVAILABLE.

OTHER PLURONICS ARE AVAILABLE IN SAMPLE QUANTITIES.

TREND OF PROPERTIES ACROSS GRID



EMULSIFICATION— ALL PLURONICS HAVE FOUND APPLICATIONS AS EMULSIFYING AGENTS.

*ABOUT 10% PLURONIC L61 (BASED ON THE TOTAL WEIGHT OF PLURONIC) EFFECTIVELY REDUCES THE FOAMING OF THE OTHER PLURONICS.

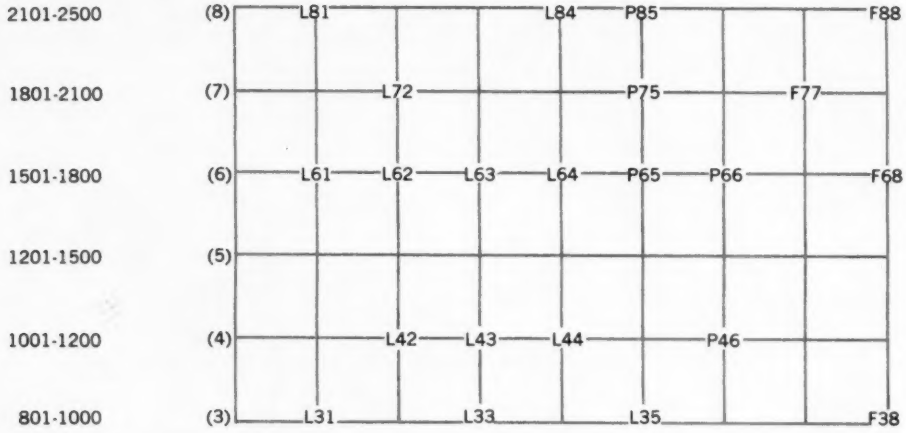
from the Pluronic Grid

PLURONIC GRID

% POLYOXYETHYLENE (HYDROPHILIC UNIT) IN TOTAL MOLECULE

(SECCND DIGIT)		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%	0	10	20	30	40	50	60	70	80

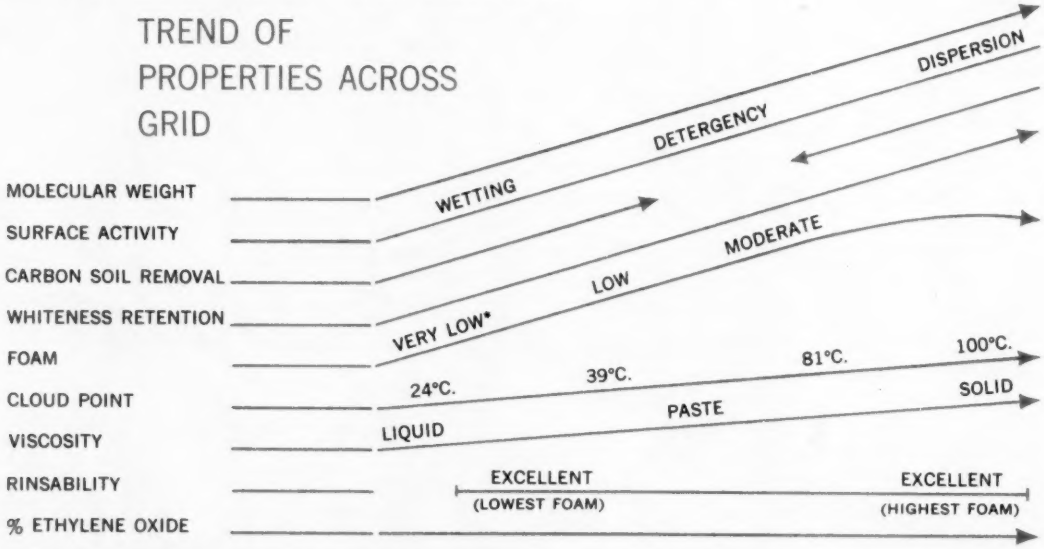
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PLURONICS L61, L62, L64, L44, P75, AND F68 ARE COMMERCIALLY AVAILABLE.

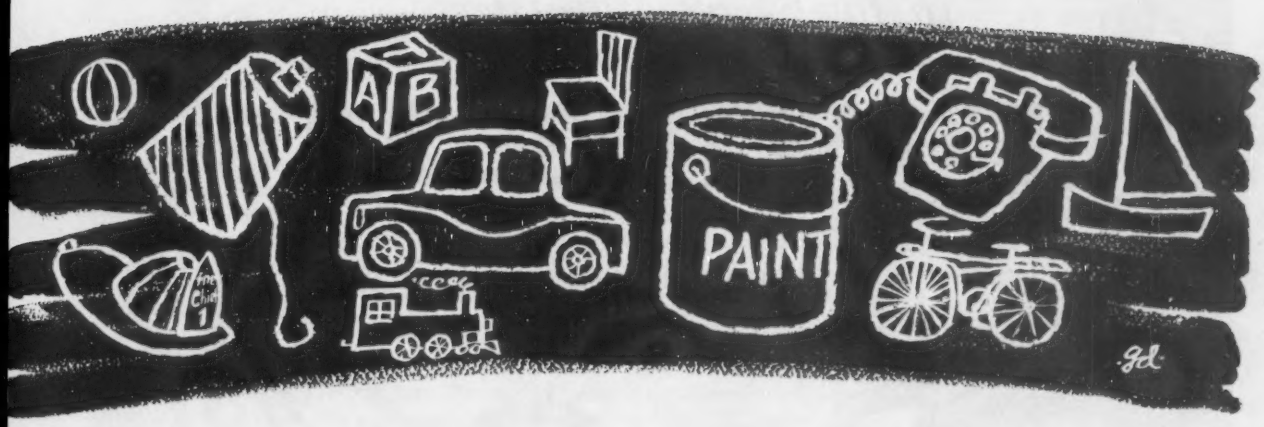
OTHER PLURONICS ARE AVAILABLE IN SAMPLE QUANTITIES.

TREND OF PROPERTIES ACROSS GRID



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*ABOUT 10% PLURONIC L61 (BASED ON THE TOTAL WEIGHT OF PLURONIC) EFFECTIVELY REDUCES THE FOAMING OF THE OTHER PLURONICS.



You'll Be Seeing Them in a New Red

Mercadium reds, new pigments from Imperial Paper & Color, are bidding for use in paints, plastics, rubber, printing inks, other applications requiring heat- and light-stable red colors.

They're said to be equivalent in quality to the present high-performing cadmium sulfoselenides; but they contain no selenium, cost less.

Imperial expects them to slice a big piece of the $5-million cadmium reds market.

It's not every day that the staid pigments industry gets excited. Today, however, cadmium pigment makers are as close as they have ever come to being in a real furor. Reason: new selenium-free pigments—called Mercadium Reds—from Imperial Paper & Color (Glens Falls, N. Y.) are allegedly proving every bit as good as the selenium-containing cadmium sulfoselenides that up to now have been the only satisfactory heat-, light-fast red pigments obtainable. First returns were so encouraging that this week Imperial is gearing up production to meet tonnage demands.

The Mercadiums are cheaper, too, ranging from $1.78-2.40/lb.—as opposed to $2.24-3.77/lb. for comparable cadmium lithopone shades (extra light to dark red). That's because the newcomers—reported to be a solid solution of cadmium and mercury sulfides—aren't dependent on critically short, price-rocketing selenium.

Thanks to all of these factors, Imperial's Mercadiums are in a good position to cut a hefty chunk of the estimated $5-million cadmium reds market (*CW Market Newsletter, Feb. 18*).

Well aware of this, other major cadmium-red producers admit the Mercadiums have them worried, are hustling to come up with competitive lines.

Glidden (Cleveland) seems closest, reports a product in the pilot-plant stage, hopes to make an announcement about it shortly. Kentucky Color & Chemical (Louisville) says it's been doing intensive research since last October, hasn't come up with anything yet. Harshaw Chemical (Cleveland) admits the Mercadiums seem good; it, too, is researching a product, hasn't yet turned up anything. General Color (Newark, N. J.) says it also is interested.

The Mercadium color standards are said to compare very closely with comparable cadmium sulfoselenide standards; other properties are held to be equal to or better than those of the cadmium reds. In tinting strength, for example, the Mercadiums reputedly surpass the present cadmiums. And at temperatures from 500-900 F, the newcomers are said to be lighter and cleaner in shade.

The challengers are held to be on an equal footing with the cadmium reds in light resistance, nonbleeding characteristics, and alkali resistance. Acid resistance for both is described as reasonable to organic acids and low concentrations of mineral acids.

On the negative side is toxicity. Although mercury sulfide is insoluble and apparently inert, any untested mercury compound is looked upon with suspicion by potential users. To gain full acceptance, the Mercadiums will have to hurdle this toxicity barrier. (Recently completed oral toxicity tests gave the Mercadiums a clean bill of health; subacute tests are now under way.)

One other drawback: Imperial reports that above 1000 F, the Mercadiums fail, lose their redness. This limits their use in the relatively small ceramics coloring field.

Although out only several weeks, the Mercadiums are already drawing comments from interested companies.

Sherwin-Williams and other major paint producers say their preliminary tests show that Mercadiums compare

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in tank-car quantities

HEXANETRIOL-1,2,6



a long-chain polyol

for

polyurethane resins and isocyanate foams
modified alkyd resins
humectant-plasticizer applications

The three hydroxyl groups of hexanetriol-1, 2, 6 are readily esterified under normal cooking conditions. Alone or in combination with other polyols, hexanetriol-1, 2, 6 reacts with dibasic acids to make polyester resins and alkyd resins with greater flexibility and increased compatibility with other resins. Hexanetriol-1, 2, 6 offers a new approach to the manufacture of polyurethane resins and isocyanate foams. Because of its configuration, limited hygroscopicity (about 40 per cent of glycerol), and solvent properties, it is effective as a humectant-plasticizer for water-dispersible resins. Hexanetriol-1, 2, 6 is now available in tank-car quantities. Order now and put this valuable triol to work for you.

PROPERTIES OF HEXANETRIOL-1,2,6

Specific Gravity at 20/20°C.	*1.1063*
Boiling Point at 5mm. Hg	*178°C.*
Vapor Pressure at 20°C.	*< 0.01 mm. Hg*
Freezing Point	*Sets to a glass below -20°C.*
Solubility in Water at 20°C.	*Complete*
Viscosity at 20°C.	*2584 cps.*
at 40°C.	*512 cps.*

for Further Information

. . . write the CARBIDE Office nearest you for the technical bulletin on Triols (F-7779). CARBIDE also supplies pentanediol-1, 5 and 23 other glycols and polyglycols. In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal and Toronto.

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favorably with the present cadmiums. However, paint people emphasize that extensive ultraviolet and outdoor exposure tests must be run before they'll pass final judgment. Also, more toxicity data is needed before they'll consider production runs.

Paintmakers say, though, that if Mercadiums prove out, on the basis of availability and price, they could replace the cadmiums.

Bakelite is evaluating the fledglings in polystyrene and vinyls, reports it has used the Mercadiums interchangeably with present cadmiums, replacing the cadmiums directly, with little or no color adjusting required. Bakelite feels that the newcomers, barring a price rise, could eventually replace the cadmium sulfoselenide pigments.

U.S. Rubber is trying them in Royalite, a modified polystyrene used as upholstery. Early results reportedly show the Mercadiums are equivalent to cadmium reds, have good aging characteristics, no apparent limitations in use.

Goodyear Tire is also testing them, says it hasn't had time to form an opinion of their worth.

Kienle (Huntington, N. Y.), a printing ink manufacturer, says the Mercadiums appear to be as good as the present cadmiums.

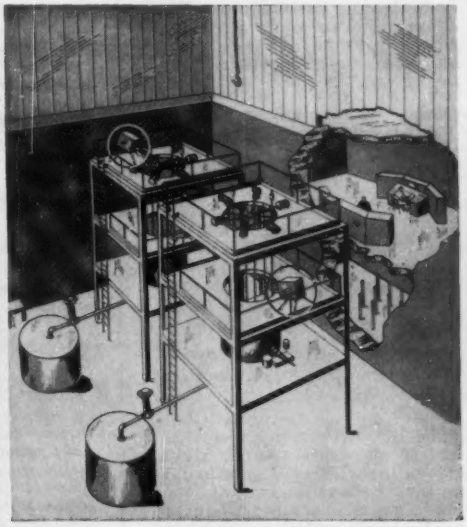
Imperial asserts its pigments are a brand-new development rather than a modification of an existing type. The Mercadiums are described only as a solid solution of mercury and cadmium sulfides of the lithopone variety (a chemically pure line is reportedly due later).* All process details are top-secret. Patents** have been filed by Louis Gagliano and James Daly, who sparked the two-year research effort.

A Puzzler: Imperial's use of mercury sulfide to make a heat- and light-stable product has other pigment makers scratching their heads. On the face of it the reaction shouldn't work. Mercury sulfide (English vermilion) is a well-known inorganic red, but has

*Lithopones contain barium sulfate, which acts as a diluent, extends the pigments. It occurs during formation of cadmium sulfide, made by precipitating cadmium sulfate and barium sulfide. The chemically pure pigments contain no barium sulfate, are concentrated, more expensive: $4.25/lb.-7.60/lb. They're made by precipitating cadmium sulfate with either sodium or hydrogen sulfide.

**It's not known whether patents are filed on the process or product. One competitor reportedly made a patent search of cadmium-mercury sulfide pigments, found nothing.





Reactor Core Research Center

BATTELLE'S NEW REACTOR development laboratory is reputedly the first private installation of its kind available for direct research on atomic power plants. A critical assembly lab, it will be used for full-scale model studies of nuclear reactor cores (some design factors can be determined only by experimentation). In the case of an operating reactor, it will permit evaluation of proposed innovations without interrupting operation. Design studies are carried out at one or two watts power—at which no shielding or coolant is required—to permit quick adjustments of fuel, moderator, control rods, etc., in determining their optimum arrangement. The control panel (*left*) embodies all the controls used for a full-scale reactor, contains a closed-circuit TV screen for viewing reactor cores during experiments. Shown in the sketch (*right*) is the laboratory, two experimental critical assembly mock-ups, and the TV cameras. Uranium is stored in a vault under the control room. It's all part of a $3.5-million atomic research center Battelle is building at its Columbus, O., headquarters. A "hot" cell laboratory, completed last September, is now being used in studies of radiation effects on reactor construction materials. Expected to be operating later this year is the institute's swimming-pool-type research reactor.

New
ALKYL ARYL SULFONATES
by NINOL
available for many uses...

Several new varieties have now been added to the list of NINOL alkyl aryl sulfonates already in wide commercial use. They offer exceptionally interesting possibilities for many uses—as emulsifying or foaming agents, detergents, solubilizers, coupling agents; and as components in industrial cleaners, rust inhibitors, cutting oils, lubeoil additives, and many other formulations.

Growing* NINOL *Line Now Covers Full Molecular Weight Range . . .

This complete line of liquid alkyl aryl sulfonates covers the whole range of molecular weights from the smallest to the largest. The products in the NINEX series (lower molecular weight), are *water soluble*: in the NINATE series (high molecular weight), *oil soluble*. Thus, the line is exceptionally flexible in possible adaptations to many purposes, where a range of hydrophilic and hydrophobic properties are important.

Available for Immediate Use, or for Testing with Your Own Product

The first four items listed in the adjacent column are in regular volume production and in wide commercial use. The last two items are newer additions are available for working tests under your own conditions. Full information and working samples are available for each, and for other special alkyl aryl salts as well.

A* NINOL *Specialty—Modification or Development of New Varieties for Unusual Needs . . .

In addition to the items listed above, NINOL can supply a wide variety of experimental alkyl aryl sulfonates based on unusual amine or metallic cations, for use in research or such products as fuel oil additives, leather treating oils, rubber, paints, etc. Working samples of all these items are available.

These products are made by NINOL's unique liquid sulfur trioxide process—another example of NINOL's pioneering approach to better surfactants.

Delivery can be made from stock points across the country.

★

NINEX 303

A 40% aqueous solution of sodium xylene sulfonate . . . Now used as a coupling and solubilizing agent in industrial cleaners, where its hydrotropic properties help dissolve detergents in electrolyte systems; to solubilize reactants in the preparation of certain dyes; and for other purposes.

NINEX 300

A 60% aqueous solution of triethanolamine dodecyl benzene sulfonate . . . Excellent for highly concentrated liquid detergents; used widely as a foaming agent in cosmetics and industrial cleaners. Freeze resistant.

NINATE 411

A 95% active alkylamine dodecyl benzene sulfonate . . . Water dispersible and oil soluble, it is an excellent emulsifying agent and solubilizer. Recommended for making clear blends of petroleum solvents and water.

NINATE 402

A 50% solution of calcium dodecyl benzene sulfonate in oil . . . For blends with nonionic surfactants in the manufacture of agricultural emulsifiers and similar products. Also available in more concentrated form (NINATE 401).

NINATE 421

A 60% active sodium alkyl aryl sulfonate in oil . . . High in molecular weight (about 450), it is readily oil soluble, and can be used in rust inhibitors, lubeoil additives, cutting oils, and many other applications.

NINATE 430

A 60% active alkylamine alkyl aryl sulfonate in oil . . . Top of the scale in this series in molecular weight (about 480), it is high in oil solubility. Among many potential uses may be included ashless corrosion inhibitors, gasoline inhibitors, and as an emulsifier component. NINATE 430 is a specialized sulfonate of a type not widely marketed heretofore.

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In Canada: Chemical Developments of Canada Ltd., 430 Lagauchetiere St. W., Montreal 1, Quebec

notoriously poor heat- and light-resistance.

To make a cadmium pigment, however, it's necessary to calcine or "fire" it at high temperatures. A dry blend of cadmium and mercury sulfides is not a pigment. On exposure to light, the mercury sulfide gradually sublimes, leaving an orange or faded red. Theoretically, the firing should decompose the mercury sulfide that much faster.

How does Imperial do it? One guess: they first calcine the cadmium sulfide (a yellow) at an elevated temperature, then calcine the cadmium and mercury sulfides together at a lower temperature. But that's a guess. As one manufacturer says, "Making a good cadmium red is difficult because every step along the way must be carefully controlled."

Secret of the cadmium sulfoselenides' success is said to go back to the formation of the basic crystal at the precipitating stage. The calcining step further modifies it to the proper crystal size (0.2 to 0.7 microns). Outside this range, the pigment lacks superior opacity.

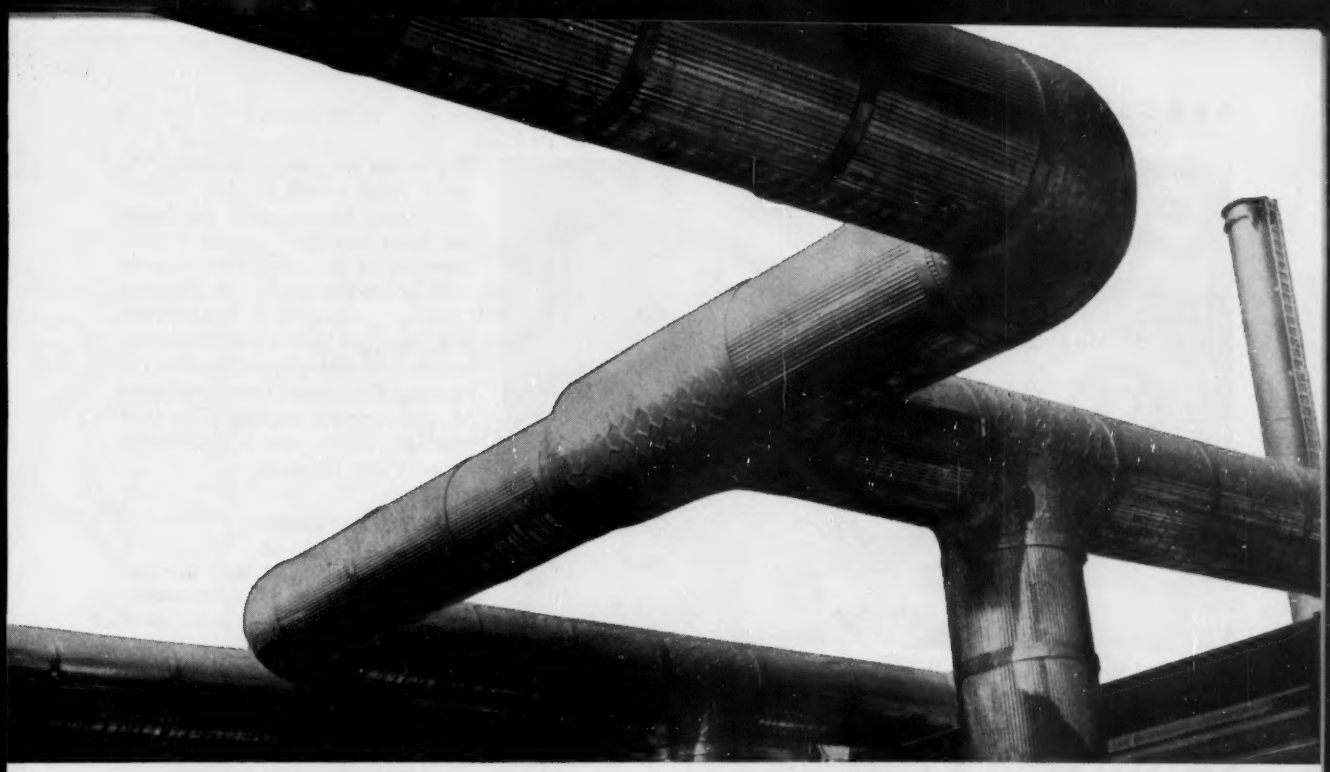
Presumably, Imperial has learned the knack of putting together the cadmium and mercury sulfides, and has the right crystal structure.

Imperial's jump on the market is directly related to the past superiority of cadmium-selenium pigments. Everyone was satisfied with them; no one started looking for new ones until recently when selenium became scarce.

Selenium ranks as one of the most critical materials. Most goes to the electrical industry for rectifiers, very little is available for the chemical industry. And with the government stockpiling selenium, even less can be expected in the future.

As the supply tightened, the price soared. A year ago, selenium cost $7.25/lb. Two weeks ago, the price took a jump from $10.50/lb. to $15.50/lb. And as the price of selenium goes, so goes the price of cadmium sulfoselenide pigments.

Lower price and comparable properties of the Mercadiums, plus unlimited availability of raw materials, have given one evaluator cause to remark, "Only question in our mind is: if the Mercadiums prove out and a boom should come, can Imperial meet it?" Judging by the firm's now-in-progress expansion, Imperial is moving to answer that question.



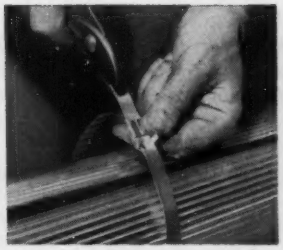
Years of maintenance-free weatherproofing with jacketing of ALCOA ALUMINUM FOIL cost less than one good paint job



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Now you can weatherproof and protect insulated lines, both outdoors and indoors, quickly, easily and economically—with jacketing of ALCOA Aluminum Foil. Just wrap it and forget it, because metallurgists estimate aluminum jacketing requires *no maintenance for as long as ten years* in many applications.

First costs and application costs are low, too—lower than even the cheapest weatherproofing when the cost of one paint job is considered. In fact, many users find aluminum foil jacketing costs no more—*frequently less* —than one good paint job!

Jacketing of ALCOA Aluminum Foil is corrosion resistant, requires no painting, is available with or without moisture barrier attached. This corrugated aluminum covering can be used over any type of insulation.

ALCOA does not make aluminum foil jacketing, but we will gladly refer you to reputable manufacturers who do. Write to ALUMINUM COMPANY OF AMERICA, INDUSTRIAL FOIL DIVISION, 906-B Alcoa Building, Pittsburgh 19, Pennsylvania.

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Catalysis Promoter

Despite radiation's looming importance as a chemical-reaction inducer, research in catalysis-by-chemicals is more active than ever. The reasons are embodied both in radiation's limitations* and in the growing realization that chemical catalysis is the heretofore unsuspected key to reactions in fields ranging from brain chemistry to plant growth. This week, plans are being drawn for a meeting aimed at catalyzing progress in the somewhat nebulous science of catalysis itself.

The event: the first† International Congress on Catalysis, scheduled for Philadelphia's Bellevue-Stratford Hotel, Sept. 10-14. The congress is designed to effect an interchange of ideas by scientists whose concepts of catalysis vary as widely as their geographic location.

• Here from Institute of Technology (Hannover, Germany), R. Suhrmann and G. Wedler will speak on new methods of investigating the mechanism of molecular decomposition on catalysts. Knowledge of this kind is essential to tailor-making catalysts of high selectivity for specific reactions.

• The topic of Illinois Institute of Technology's (Chicago) M. L. Bender and B. W. Turnquest—"General base catalysis in the hydrolysis of some esters. A model for enzymatic catalysis"—points up the growing understanding of catalysis in biochemistry.

• Characteristic of the possibilities opened by new catalysis tools is the subject of a paper by University of Innsbruck (Austria) investigator Erica Creamer: "A study of catalysis surfaces by gas chromatography."

• Covering a well-established catalyst-promoted synthesis is a paper by S. K. Bhattacharyya, of the Indian Institute of Technology, titled "High-pressure synthesis of glycolic acid from formaldehyde, carbon dioxide and water."

• Also on industrial catalysis: a paper by North Thames Gas Board (London) researchers on "The physical properties of chromia alumina"—which are increasingly important in butane dehydrogenation for making butadiene.

• And in the realm of relatively new catalysts will be the University of Delft's (Holland) H. I. Waterman's talk on sulfur dioxide as a catalyst.

Expected to attend the congress is a cross-section (500-1,000) of catalysis experts from India, Japan, Australia, Europe, Union of South Africa, and other nations. In many cases, their trips will be financed by ICC.

According to Houdry Process Corp. (Marcus Hook, Pa.) catalyst researcher Heinz Heinemann, executive secretary of the congress, there should be ample funds (about $37,000 contributed largely by leading oil and chemical firms and the National Science Foundation) to see the congress through. Sponsored by the Catalysis Clubs of Chicago and Philadelphia, NSF, and the University of Pennsylvania, the meet has been two years in the planning. Heinemann holds high hopes for the congress, expects it to shed welcome light on what is traditionally a murky area of research.

*It's not very effective in non-free-radical reactions.

†Except for a meeting somewhat smaller in scope sponsored by England's Faraday Society at Liverpool in 1950.

Drug Flurries

This week's crop of drug developments turned up these hopeful entries:

• Synthesis of the first orally effective drug for the relief of muscle spasm in musculoskeletal and neurological disorders is claimed by McNeil Laboratories (Philadelphia). Named Flexin, the product's generic designation is zoxazolamine. It reportedly features freedom from side effects, a duration of action of about six hours. Potential applications include treatment of rheumatoid arthritis. In addition, it is intended to serve as an adjunct in the treatment of neurological disorders (e.g., cerebral palsy, multiple sclerosis, Parkinson's disease, etc.).

• Tubocurarine—active principle of curare—cuts the recovery time of polio victims, according to a report by physician George Boines, chief of the contagious diseases section, Doris Memorial Unit, Wilmington, Del., General Hospital. The agent was administered in Tubadil, developed by Endo Products Inc. (Richmond Hill, N. Y.), which releases minute amounts of tubocurarine over a 12- to 24-hour period after injection.

• A new anthelmintic for ascarids and nodular worms of swine is being offered to veterinarians by Upjohn Co. (Kalamazoo, Mich.). Called Parvex, it contains 22% of the betaine of 1-piperazine carbodithioic acid in an inert diluent.

• At the Children's Cancer Research Foundation, Children's Medical Center (Boston, Mass.), a new class of 1,2-dihydro-S-triazines has been synthesized. The compounds are described as having antimalarial, antitumor, and anticoccidal properties.

• Taurine, a metabolite used widely in biological and biochemical research, is now being produced by Mann Research Laboratories, Inc. (New York).

Who's handling public relations for you behind the Iron Curtain?

It's not an easy assignment—or the kind you'll find many people volunteering for.

But there *is* an important "public relations" job to be done behind the Iron Curtain—for you . . . for America . . . for the whole concept of freedom, free enterprise and individual rights. This job is an opportunity and a challenge as well as a serious responsibility for American business. Fortunately, with your help, there *is* an agency that can do the job—*Crusade for Freedom*, which supports Radio Free Europe and Free Europe Press.

Both these powerful, privately operated organizations continually challenge the barrage of Communist misstatements and false truths. Using saturation radio broadcasts and mass newspaper drops from message balloons, Radio Free Europe and Free Europe Press are constantly on the offensive against the Red campaign to annihilate right, reason and national pride.

Continued and heated Communist protests testify to the tremendous effectiveness of Radio Free Europe and Free Europe Press. Support freely given by free American business and private citizens will increase this effectiveness and the scope of their operations. A contribution now is perhaps the best investment you can make towards a peaceful, prosperous world.

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- ☐ Order display material for your company bulletin board.
- ☐ Plan a paycheck stuffer to fully acquaint your employees with the importance of the Crusade for Freedom.
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- ☐ Match employee funds with *your Truth Dollars.*

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Many industries have already recognized the present and future advantages of Lake Erie's rich northeast-Ohio shore. Two and one-half billion dollars have been invested in new plants and expansion in this area since 1946.

Ford, for instance, needed a site for a huge new foundry and two new engine plants. The requirements: 196,000 tons of pig iron per year—2,500,000 gallons of water per day—excellent transportation facilities—plus 12,000 workers. Ford found them *all* in the Greater Cleveland area.



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THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

RESEARCH . . . . . .

APPARATUS

Automatic Distiller: Precision Scientific (Chicago) is out with a redesigned automatic apparatus for distilling gasoline, kerosene, naphtha, similar petroleum products, according to ASTM D 86. Feature: entire distillation is automatic once the charged flask and chart are in place and initial heat is selected. Two distillation rates are provided: 4.5 ml./minute, 9.0 ml./minute.

•

Gamma-Ray Detector: A new scintillation detector for gamma-ray counting is now available from Nuclear Instrument and Chemical (Chicago). It's expected to find use in clinical, research and industrial labs utilizing gamma-emitting isotopes.

•

Floodproof Condenser: Scientific Glass Apparatus (Bloomfield, N.J.) is introducing a nonflooding reflux condenser—the Dalin Coil Condenser—that precludes loss of valuable products during synthesis. A novel bypass joint is said to be the secret. The joint also serves as an adapter, permits the joining of large-capacity condensers to small-necked flasks.

•

Rotameter Kit: Brooks Rotameter (Lansdale, Pa.) has a new kit for high-pressure laboratory, pilot-plant and field measurement of gas flow rate. Designed for service up to 3,000 psi., 200 F, it's said to feature a unique equalizing vent that permits use of glass metering tubes at high pressures with no danger of tube rupture. Kit covers a wide flow-range, includes 4 metering tubes, 19 spherical floats.

•

Rubber Rings: For static seal applications involving hydraulic fluids, Parker Appliance Co. (Cleveland) is offering O-rings made from a reportedly new synthetic rubber material. Seals are said to be suitable with fluids MLO-8200 and Monsanto OS-45 at temperatures from —65 to 400 F., and MIL-8515 at 400 F.

•

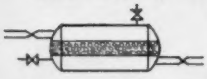
Navy Project: The U.S. Navy is reportedly negotiating a contract for construction of new research facilities near Model City, east of Lewiston, N.J. Initial cost of the facility, which will be operated by Olin Mathieson Chemical Corp., is expected to be about $3 million.



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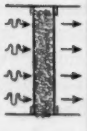
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Phosphoric Acid
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RESEARCH . . . . . .

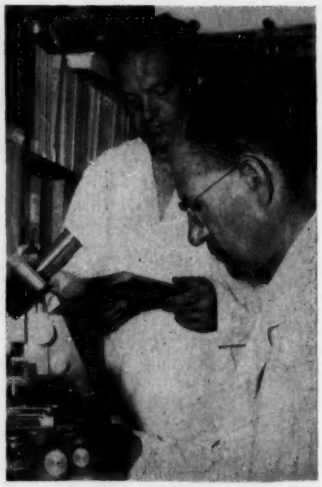
Standards: Two new American Petroleum Institute standard hydrocarbon samples are available from Carnegie Institute of Technology's Petroleum Research Laboratory (Pittsburgh, Pa.). The compounds: 3,4-dimethyl-*cis*-2-pentene and phenylbenzene. Price: $50/5 ml.

•

Anion Exchanger: Hydrous zirconium oxide has desirable anion exchange properties, according to recently reported research at Oak Ridge National Laboratory of Atomic Energy Commission. Features: high chemical stability and adsorptive capacity, rapid response, useful selectivity.

•

Dextran Opportunity: According to newly reported research at Commonwealth Engineering Co. (Dayton, O.), dextrans appear promising as soil conditioners. In trials using 1½ oz. of the dextrans/sq. ft. of soil, plant growth was reportedly boosted 70%, seedling emergence up to 44%.



Researchers' Reward

FOUNDER and head of Zori, Israel's first pharmaceutical firm, is Moshe Grotto (*right*), shown with research staffer and recent immigrant Paul Schneeweiss. Grotto's research at a small Tel Aviv laboratory led to "Prolongal Benzocaine," an anesthetic that reportedly staves off pain for as long as 29 days. Result: a new enterprise.

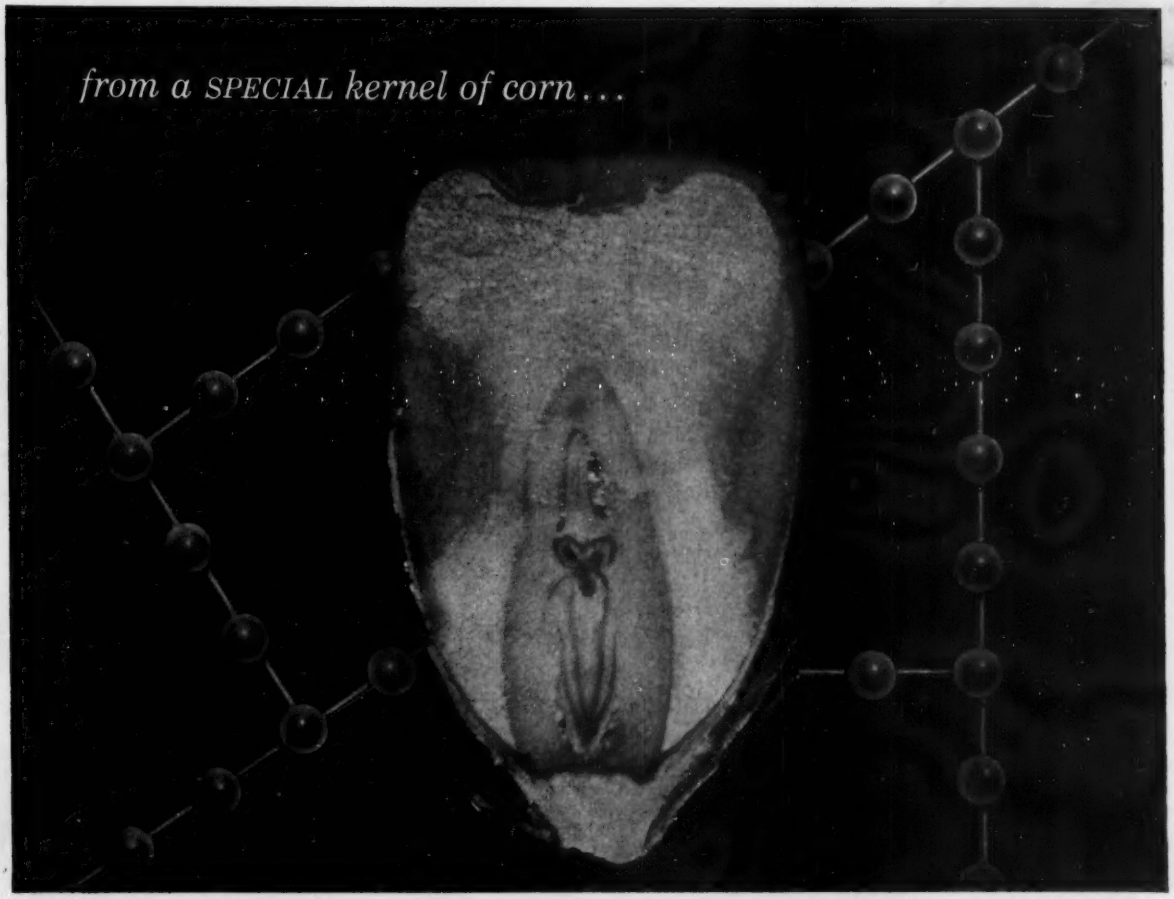


Photo courtesy of Corn Industries Research Foundation, Inc.

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—that effectively resists retrogradation or "set back" after cooking. This is AMIOCA, National's highly branched, 100% amylopectin starch*. It forms strong, clear, continuous films and exhibits excellent resistance to jelling.

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Where can you use AMIOCA?

*AMIOCA (amylopectin) is one of the two molecular components of ordinary corn starch. The other component known as amylose—which is linear, is absent in the AMIOCA starch. AMIOCA is produced from a unique hybrid corn grown especially for National, and refined in our Indianapolis plant.

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By: LOUIS J EVEN, *Sales Manager*
New Orleans Branch
Bag Division
Fulton Bag & Cotton Mills



• Typical of problems solved by Fulton for chemical and other industries was that posed by the following requirements:

A supplier of plaster aggregate wanted a bag that would carry 100 lbs. of plaster *without sifting* . . . a bag that could be opened and emptied quickly at the job site, *and yet* be durable enough to re-use for deliveries to this job many times.



• This customer was delighted when Fulton came up with a heavy-duty Osnaburg fabric bag that could be opened and closed quickly.

These Fulton-created bags were used and re-used—over 30 times!

This cut the cost of delivering the aggregate by over 60% compared with ordinary, non-re-usable bags.

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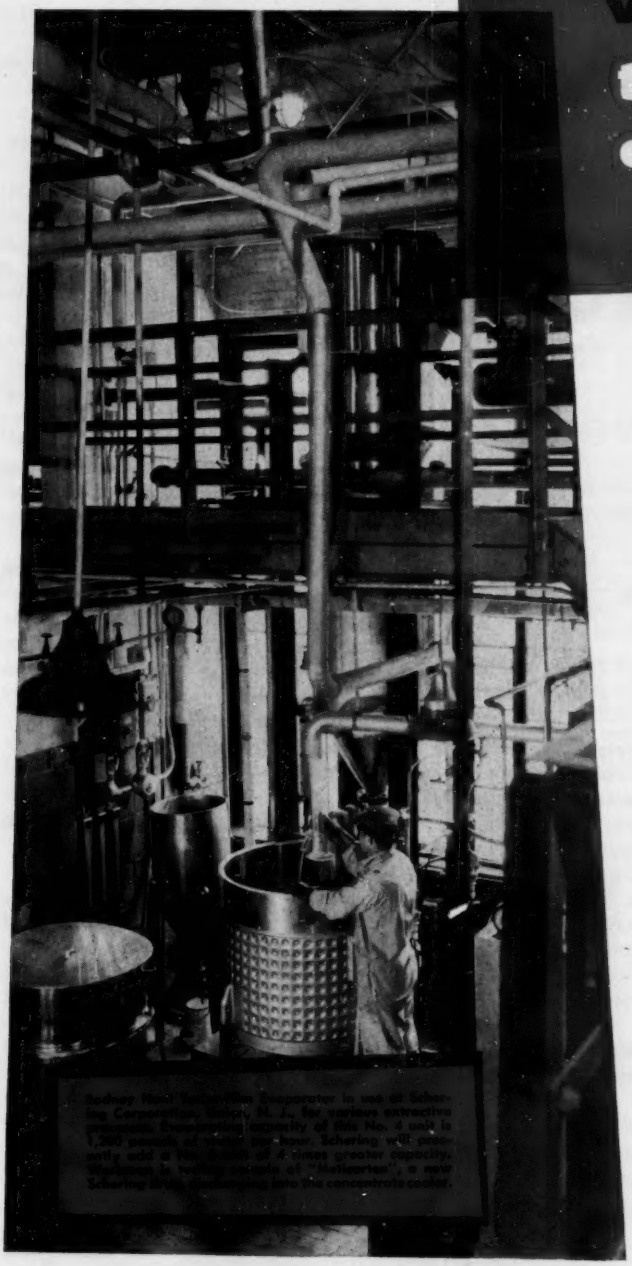
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What was once a batch operation is now semi-continuous . . . and the Turba-Film Evaporator occupies only a tenth of the space required for batch operation! Schering is multiplying its Turba-Film Evaporator capacity by the addition of a No. 6 Turba-Film unit of 5000-gallons-per-hour capacity.

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WIDE WORLD

FLYING-ON DEFOLIANTS: To boost sales, chemical clouds for new crops.

More Fields to Cover

New use—on edible dry beans—may add 15-20% to the $10-12-million market for defoliant chemicals, now largely dependent on cotton for sales volume.

Sodium chlorate-borate compounds head the pack of defoliants suitable for bean application. They're economical to use, effective, safe.

But educating the farmer to try the chemicals is a tough problem, and it tempers the optimism of most manufacturers.

When you produce chemicals that ring up sales totaling $10-12 million a year in just one branch of agriculture, you're bound to feel that they ought to have outlets in other phases of farming, too. Makers of chemical defoliants* fit this pattern—in the past decade, they have seen their products roundly welcomed by cotton growers. But they have yet to find another really substantial market.

Now, their luck may be changing. Defoliant makers have their eyes on a new market, which doesn't touch cotton in potential, but nonetheless stands a good chance of assuming important proportions. Their target: edible dry beans.

Reaping Profits: Used in trial amounts on beans (less than 10,000 acres) last season, the defoliants have shown the one important advantage that can insure their widespread acceptance: they are economical to use—cost of treating an acre is less than the price of a bushel of beans and, in some cases, the chemical seems to have increased the yield. There are some additional pluses, too:

- They simplify and speed up the harvesting; pick is clean and free from trash.
- They boost the market price of the beans—there are fewer discolored beans, and the moisture content is nearer the desired percentage.
- And—an advantage to manufacturers—county agents seem likely to recommend defoliant use.

Chipman Chemical Co. (Boundbrook, N. J.) is driving hardest for the new market with its liquid Shed-A-Leaf products: sodium chlorate-sodium borate mixtures. The borate is added to reduce fire hazard in the foliage treated with strongly oxidizing chlorate. Magnesium chlorate hexahydrate defoliants (like Dow's Magron, General Chemical's E-Z Off and Pennsalt's De-Fol-Ate) have also showed promise and disodium 3,6-endoxohexahydrophthalate (Niagara's Endothal) is very effective, but in some tests has marked the beans.

Leashed Optimism: Despite hopes for a tidy defoliant market in the bean field, most manufacturers aren't letting their optimism get out of hand. In the past, defoliants have looked good in a number of noncotton applications, none of which ever developed into a market as big as the one anticipated:

- On potatoes, defoliants currently find their next-to-greatest use. The chemicals have been used for several years throughout Eastern potato-growing areas, as well as in other regions where commercial farming of potatoes is common. Like mechanical macerators, which kill the vines by beating them, the chemicals are used to remove excess greenery that interferes with machine harvesting.

Sodium arsenites (probably the most widely used for vine killing), calcium cyanamide, and dinitro phenols do the job very well. But they stand at the end of a list of chemicals a potato grower must buy, and he frequently skips them if the market for his crop slumps. The sales potential—an estimate based on '54's 1.2 million acres of potatoes—is about $3 million, but actual sales are probably closer to 8-10% of that.

- Soybeans present a potential almost as tempting as that of cotton—about equivalent acreages were planted in '54 (16-18 million acres) according to the latest available U. S. Census of Agriculture figures. But the market has proved rather disappointing. Employed to remove leaves for easier harvesting, and to lower the moisture content of the beans, the chemicals are often not really necessary, and low soybean prices seldom allow the farmer enough leeway to experiment with chemical defoliation. As a result, treated acreage is only 2-3% of total, and it varies greatly with weather and bean price.
- Defoliants have also been tried, with generally good results, on rice, sorghum crops (like millet), tomatoes,

*Defoliants are often considered along with desiccants. Their action is quite different, although the end result is sometimes similar. Defoliants hasten plant maturity, cause leaf drop and a lessening of moisture. Desiccants simply kill all greenery they contact—leaf drop is sometimes just a part of this drying-out process induced by the desiccant.



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Increases in freight rates over the past several years make it highly advantageous for you to re-examine the form of caustic you are buying.

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and several others. They can also do a valuable job on deciduous plants, such as rose bushes and nursery stock, by removing leaves before storage of plants. Again, they do a job well, but their use isn't always sufficiently profitable to the grower, and sales have therefore never been big.

Cousin to Cotton: The story on cottons is quite different. It boils down to the fact that here defoliants have been clearly profitable—cotton is cleaner, easier to pick, draws a better price, and defoliation is a necessity where mechanical picking is done. And that's the difference between lusty sales to cotton growers and trifling returns from other crop markets.

On edible beans, however, the defoliants do seem economically worthwhile—where beans are ordinarily pulled, dried, and windrowed before the step of combining, they can be sprayed with defoliant, permitted to stand a few days, then "combined" without the windrowing or ground-drying steps. There is less discoloration resulting from ground contact, and the beans are well within moisture specifications of buyers—beans sell at premium rates.

It's important to note that not all beans benefit from defoliants; limas and snap beans have so far done better alone. But the common dried bean—the red kidneys, and those slated for Boston's bean pots—find defoliants valuable. Thus, while the acreage of these beans may be low (perhaps 850,000), a high percentage of the growers seem intent on trying them.

(Chipman reports that in test areas last season, farmer enthusiasm was high. In Michigan, in particular, growers want to get the beans out of the ground fast so that they can plant wheat.)

Not all the defoliants that have been devised for use on cotton work with the beans. Calcium cyanamide, pentachlorophenol (a desiccant), Endothal, sodium ethyl xanthate and several others work well with cotton; the chlorates look best now for beans.

Even the brightest new compound for cotton, amino triazole, which is getting its second major commercial season, doesn't seem to be as effective as the chlorates. It is perhaps just as well that the less-expensive chlorates are effective with beans—the triazole is priced in a range (about $3/lb., and 2 lbs./acre is common) that makes its use steep even for cotton growers.

The U. S. Department of Agriculture figures that this year many cotton growers may use the triazole in combination with a cheaper defoliant; by using half as much triazole plus the other material, good defoliation is achieved, with the triazole preventing unwanted regrowth. (Formulation of amino triazole with sodium ethyl xanthate, however, will not be recommended by the Cotton Council** for '56.)

Cotton growers, incidentally, will be getting still another defoliant to try in the coming season. American Cyanamid has a "liquid extract" of its calcium cyanamide. The cyanamide, which has heretofore been applicable only as a bulky dust (and rather dependent on ideal moisture conditions), is thus in a handier form: 2½ gal./acre can be used in place of 30 lbs. dust.

The compound hasn't been offered before because of difficulties in stabilizing it in solution.

Nothing Left: One problem, of little concern to cotton growers but of definite concern to growers of edible beans, is residue. The defoliants are applied right at harvest time; it's conceivable that some of the chemical might get into the shelled bean. Tests so far, however, show no residue of the chlorate-borate types of defoliants.

Thus, the defoliants on beans seem to have a clear road ahead—they're economical, recommended, and safe. Whether these factors can swing farmers to their use will depend somewhat on a re-education program—one that could boost sales by as much as 15-20%.

**Included on the National Cotton Council's guide to defoliant chemicals and their manufacturers are calcium cyanamide, made by American Cyanamid Co.; amino triazole, sold by American Chemical Paint Co. and American Cyanamid; Endothal, Niagara Chemical Division, Food Machinery & Chemical Corp., and Pennsylvania Salt Manufacturing Co. of Washington; magnesium chlorate, made by General Chemical Division, Allied Chemical & Dye Corp., Dow Chemical Co., Niagara, California Spray-Chemical Corp., Pennsalt, Chipman, and American Potash & Chemical Corp.; sodium ethyl xanthate, sold by Stauffer Chemical Co.; sodium chlorate-sodium pentaborate, American Potash, Stauffer; sodium chlorate-sodium pentaborate-sodium tetraborate, Cal-Spray; sodium chlorate-sodium and ammonium borates, made by Pacific Coast Borax Co., Chipman, and Chapman Chemical Co.; pentachlorophenol, made by Chapman Chemical Co., Thompson-Hayward Chemical Co., and Stauffer.



EASTERN PUBLISHERS SERVICE

Speedy Spray for Economy

HIGH-VELOCITY agricultural chemicals sprayer just marketed by an English firm, Drake & Fletcher Ltd. (Maidstone, Kent), features deep penetration with small amounts of liquid. Developed for ground-spraying of fruit trees, the big unit has twin rows of jets, which expel solutions of pesticides at about 140 mph. Two fans blast the chemicals out, through jets that can produce a varied pattern over a 180-degree arc as the unit is pulled through the orchard.

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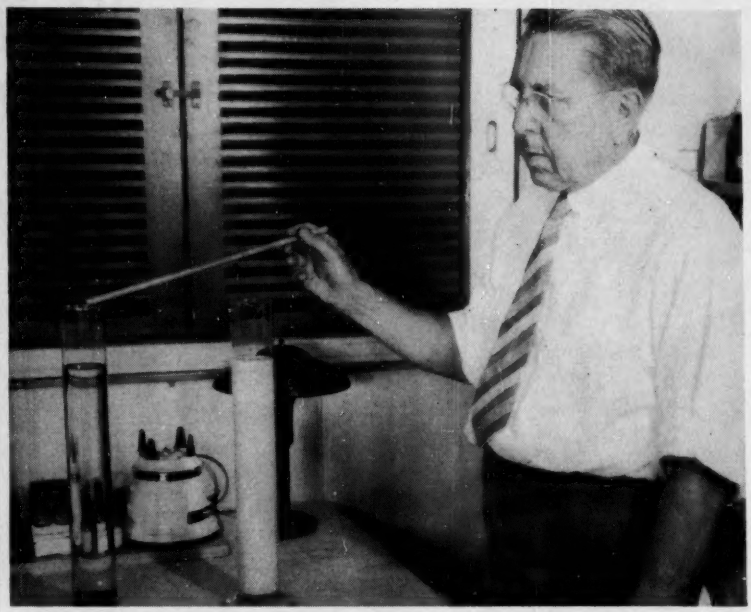
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HSPA'S HANCE: He knew what the problem was.

Inhibitor Users Don't Wait

Specialties makers have to move fast to keep up with their customers. Example: several of the latter thought the corrosion inhibitor makers hadn't answered their specific needs, so they developed their own products and, satisfied with their handiwork, are now ready to throw them onto the hotly competitive inhibitor market.

The new contestants:

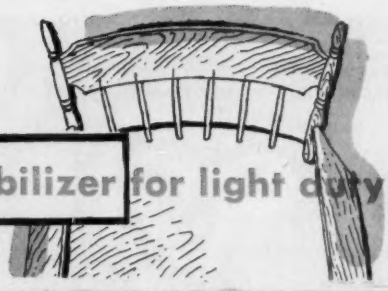
- Inhibitor H-51, patented by Hawaiian Sugar Planters Assn., made and sold in Hawaii by Pacific Chemical & Fertilizer Co. (Honolulu), elsewhere by licensee Pennsylvania Salt Mfg. Co. of Washington (Tacoma).
- UC-54, developed by Union Oil Co. (Union won't say who makes it), marketed (in California only) by Technical Services Co. (Long Beach oil well servicer).

On the Islands: Hawaiian sugar growers found that no commercially available inhibitor was giving adequate protection to equipment against the corrosive agricultural chemicals they use. Knowing the materials he had to deal with (TCA, 2,4-D, muriate of potash, phenyl mercuric acetate), HSPA chief chemist F. E. Hance figured he was in a better position to design the inhibitor than were the professionals. H-51, the one he came up with, did the job so well that Hawaiian sugar growers used 37.5 tons of it last year. (H-51 is a mixture of polyphosphates and chromates.)

In the U.S., Pennsalt is still working on sales development of the product, has produced only small lots during the past six months. Markets are expected to reach beyond agricultural situations into things like auto radiators, air conditioners, heat exchangers.

Inhibited Oil Men: Unlike sugar plantations, oil fields have not been overlooked by inhibitor makers. It is, in fact, a highly competitive business (as marketer Technical Service Co. is finding out in its efforts to sell U-54). But Union thought its first-hand knowledge of the problems could lead it to develop something more efficient. The organic inhibitor (an amine-containing compound) it came up with is, claims Union, 31% more effective than those previously used (in a five-year test, corrosion was reduced 30% by the next-best organic inhibitor, 61% by U-54).

Specialties makers, it appears, will have to be on the alert to catch opening markets while they're still open. The customers don't seem disposed to wait.



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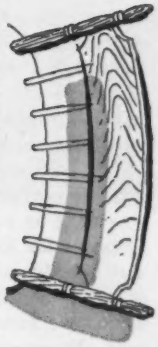
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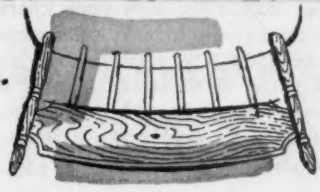
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From Research ...



...to Reality

The average consumer uses simple color names like:

- Navy blue
- Pea green
- Turquoise
- Pale yellow
- Royal purple

He's confused by ads with color names like:

- Taragen green
- Pink promise
- Nocturne
- Vintage wine
- Coppercast
- Vamp

To make color names more meaningful to more people, the Bureau of Standards is trying to standardize terms like:

- Light red
- Dark green
- Green-blue
- Dark red-orange
- Light blue-violet

Method in Color Madness

The National Bureau of Standards, working with the Inter-Society Color Council, last week issued a dictionary* of color names—the latest attempt to bridle a runaway situation. And, industry agrees, it is about time.

The rule seems to be that if you can't remember the name of a color, you make up your own. This rule has by now been followed so many times that nobody can remember the name of any color and everybody is making up names faster than they can be used (examples: kitten's ear, vamp, French nude).

The net effect has been to give us such a cacophony of color names that it is nearly impossible to talk about shades with any hope of being understood. Not only do the automobile industry, the textile industry, and various segments of the paint industry have different color vocabularies, but also different companies within each industry have their own.

NBS's attempt to organize this chaos is, in many ways, the most realistic.† Instead of trying to throw yet one more new system onto the pile, it works with the names now in use.

Using a common, fundamental set of designations as the basis of its organization, the new ISCC-NBS dictionary relates 7,500 existing names to one another.

One defect of earlier color dictionaries, which used actual color swatches, was that they failed to indicate the color range included by each name.

The new ISCC-NBS list overcomes this by dividing all possible colors into 267 groups, each identified by combinations of 21 generic terms (red, yellow, light, dark, etc.).

For example, the dictionary shows that griseo-viridis (from biology) is equivalent to serpentine (fashion), to mint green (mass market), and to light green (ISCC-NBS).

The dictionary, titled "The ISCC-NBS Method of Designating Colors and a Dictionary of Color Names," by Kenneth L. Kelly and Deane B. Judd, is in four sections. The first describes techniques of determining ISCC-NBS colors, the second contains ISCC-NBS color-name charts, the third groups industry color names under ISCC-NBS classifications, and the last is an alphabetical list of all these color names, with a code letter indicating the field where it is used, and the ISCC-NBS equivalent.

*Designated NBS Circular 553, the dictionary is available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., at $2/copy ($2.50, foreign).

†One of the more interesting earlier attempts involved the use of a plunger-operated device similar to a toy siren. Colors were arranged on the wheel in different combinations and proportions, were then blended by whirling. When the desired effect was achieved, the proportions of each color could be copied off, carried to a paint dealer who would, presumably, have another siren and could set up the same color in a jiffy. Unfortunately, he seldom had one, and the whole idea never got off the ground.

Georgia Makes Six

All indications are that a bill regulating brake fluid quality will breeze through the Georgia legislature this week. This puts the Peach State on the list that began in 1953 with Minnesota, now includes California, New Jersey, North Carolina and Tennessee.

Three other states have similar legislation pending: Massachusetts, South Carolina and Mississippi. (Some other bills—e.g., Oklahoma's—have been killed in committee.)

Not all states have had to pass bills. New Jersey, for example, has long had broad laws that could be adapted to regulate sale of brake fluids.

The Chemical Specialties Manufacturers' Assn. reports that most of the laws passed or pending are reasonably close to early drafts of its model bill, which has reached final draft status.

Brake fluid manufacturers report satisfaction with the legislation that's set up so far. Conceding that regulation was required because of dangerously low-quality fluid on the market (an indication of the quality range is seen in the price range: 16-35¢/pt.), makers were afraid that the laws would vary so much that national selling would be fraught with headaches.

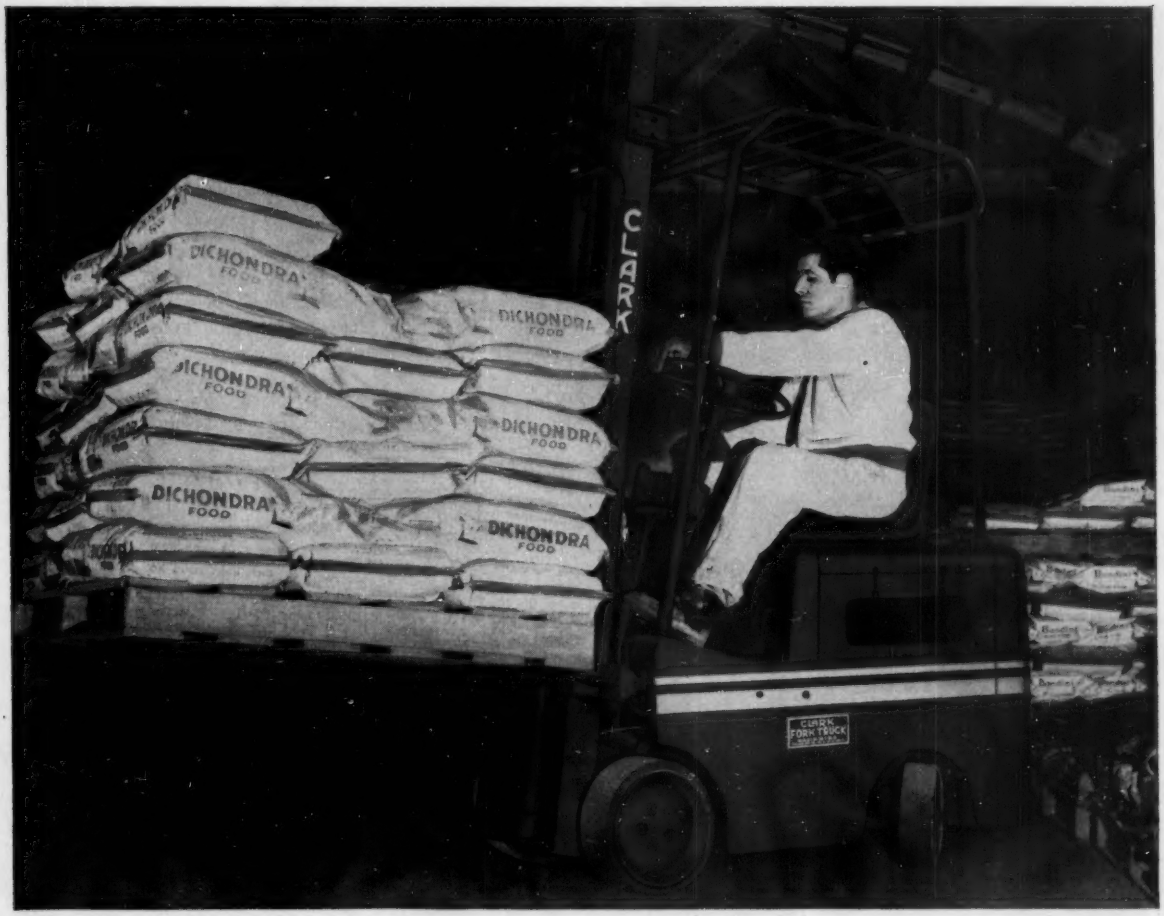
As it has worked out, however, most states simply require that fluids meet Society of Automotive Engineers' heavy-duty standards, accept certificates of quality obtained in other states. Minnesota, when it set up the first law, had manufacturers submit samples for testing, isued certificates. These are (so far) good anywhere.

New Jersey has given the most trouble, making it a crime for garage men to sell non-SAE fluids. Retailers who had a quantity of the suddenly illegal product were stuck with it unless, as in some cases, the maker took it back in exchange for SAE fluid (most make both).

This, however, is the exception. On the whole, regulation is proving more of a boon than a bane to producers and sellers.

PRODUCTS . . . .

All-Around Additive: Cutting oil, lube oil and grease, and hydraulic fluid—all are said to benefit from a product of Destiny Products Co. (Detroit). Claims: in cutting oils, it permits faster cuts; lube oil and grease gain in cold-weather performance; hy-



HURRY UP Process For Fertilizer...

The fertilizer business is primarily one of materials-handling. And, surprisingly enough, it's also a business of speed. Bring in the raw materials, mix and process, then store. When an order comes in—ship within 48 hours. That's the policy at Bandini Fertilizer Co., Los Angeles.

Key to this fast operation is a fleet of Clark fork trucks.

Because fertilizer is a bulky commodity and storage is a problem, customers order almost daily. Delayed shipments can be costly. Says Jack Baker, General Manager of Bandini, "The fact that we ship 50% of our orders the same day, and, the lack of confusion on our shipping docks, certainly proves the effectiveness of the Clark fork lifts and total palletization."

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draulic fluids lubricate better, hydraulic pump-life is boosted. Called Hyperoil, the additive is a halogenated cresyl derivative, varies in cost from $1.85/qt. (in small quantities) to $5/gal. (in drums).

•

Hot Combination: Silicones and aluminum have been combined to produce a new high-temperature coating for aircraft and automobile exhaust systems. Alumicone, as it is tagged, is made by Atech, Inc. (Toledo, O.); it can be brushed or sprayed on without use of a special primer.

•

De-spotter: Another new aerosol is Gard Industries, Inc.'s (Wilmette, Ill.) Gard Spray Spot Remover. Six-ounce aerosol sells for 79¢, is said to contain no carbon tet.

•

Farm Chore: Polyethylene bottles, with special nozzle, now have a farm role. Du Pont is selling garden insecticidal dusts in 8-oz. squeeze containers.

•

Calling All Bugs: First insect that survives a dose of Real Kill bug killer is in for a reward—$25,000, according to a promotion program planned by Cook Chemical Co. (Kansas City, Mo.). The campaign will begin in June and last 90 days.

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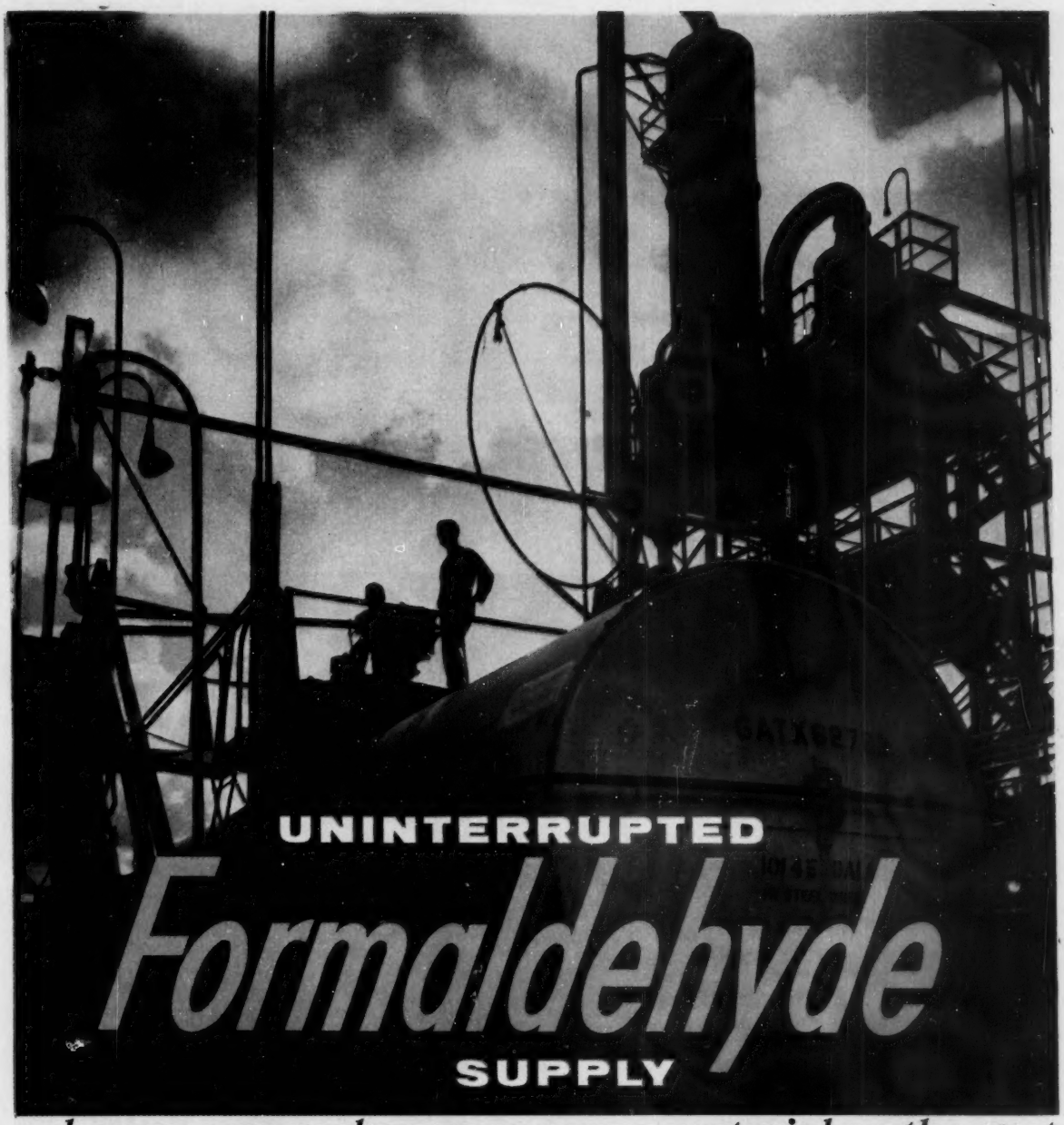
For Irregulars: For bonding irregular surfaces, Catalin Resin 8666 (Catalin Corp. of America, New York) is offered. The liquid-modified urea-formaldehyde adhesive may be used at low clamping pressures, is said to be highly craze-resistant.

•

Apple Saver: Thylate, a new Du Pont fungicide (of the dithiocarbamate family) is being readied for the 1956 apple-growing season. Application for registration with the government and petition for residue tolerance have been accepted. Tested in 17 states (11 seasons in Connecticut) the light-colored Thylate controls apple scab and cedar-apple rust, without injury to foliage or fruit, Du Pont says.

•

No Cure: A new nylon cement available in a wide range of viscosities from Ions Exchange Corp. (New York) is said to require no curing. The cement, tradenamed Nylosil, reportedly is able to fill gaps resulting from joining imperfectly matched surfaces.



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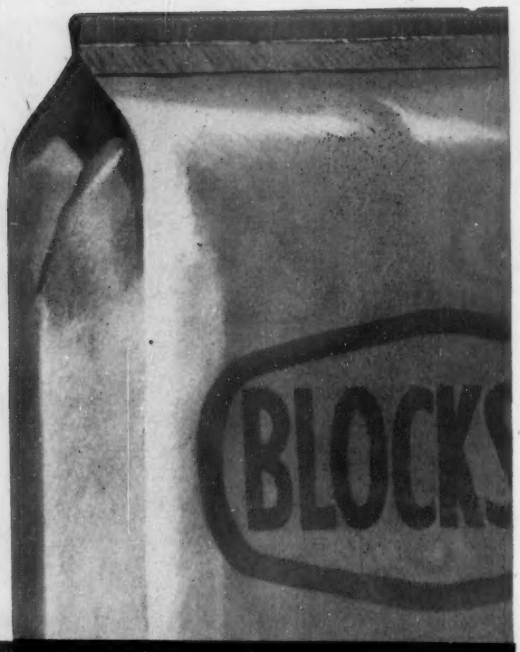
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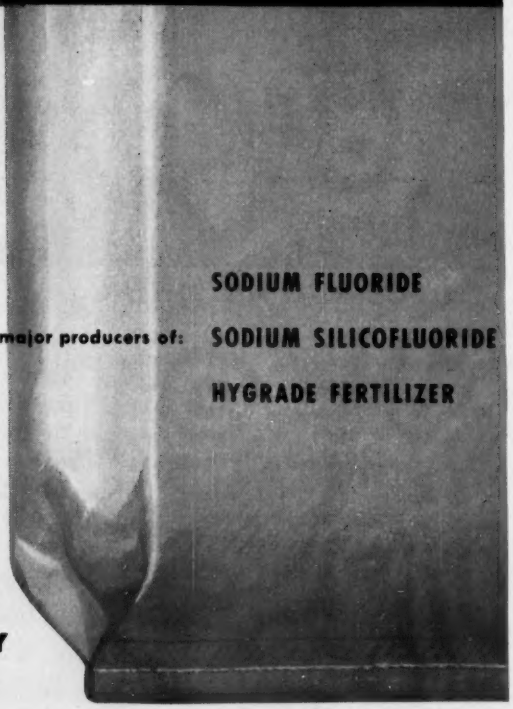
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Technology
Newsletter

CHEMICAL WEEK
February 25, 1956

Semiworks quantities of low-pressure polyolefins may start issuing from W. R. Grace this summer; commercial quantities, a year later. Pretty much as expected (*CW Technology Newsletter, Jan. 14*), the firm decided on a 150-acre site in Baton Rouge, just six miles north of the center of town.

Cheap raw materials and fuel undoubtedly were the reasons for selecting the Southwest. The exact site was selected because it's just a short (3-mile) pipeline stretch from Esso's mammoth refinery, which will supply the ethylene; it's also adjacent to the proposed Baton Rouge barge canal. (The site, incidentally, is right next door to Foster Grant's styrene monomer plant.)

Fluor will build the two-part plant. The first, or semiworks, portion will turn out polyethylene and "other polymers." Commercial unit is designed for 50 million lbs./year.

•

General Aniline & Film is shaking down its new $6-million high-pressure acetylene derivatives plant at Calvert City this week, should be in full production in a matter of weeks. GAF has been making the chemicals in its pilot plant at Grasselli, N. J., but, in this country, they've never been produced in anything approaching a commercial scale. Some products to look for: polyvinyl pyrollidone, butyrolactone, propargyl alcohol and butanediol. GAF's work is, of course, the outgrowth of the pioneering high-pressure work of Germany's Walter Reppe.

•

Escambia Bay Chemical Corp. (*see p. 40*) is basically using standard processes, but it's pioneering a new twist in hydrogen purification for ammonia synthesis: hot, concentrated potassium carbonate is used to scrub out the carbon dioxide.

The method was developed by Bureau of Mines workers Joseph Fields and Homer Benson for cleaning up synthesis gas for liquid fuels (*CW, June 14, '52, p. 39*). But Chemical Construction, which built the Escambia Bay ammonia plant, is the first to employ the technique on a large scale. Advantages claimed over conventional methods: elimination of heat exchangers, hence a reduction in steam requirements.

•

You'll be hearing more about new orally administered diabetes drugs. (Insulin must be taken by injection.) Latest firm to enter the field is Upjohn, which has a drug made by Germany's Farbwerke Hoechst under clinical evaluation. Lilly has been investigating one made by C. F. Boehringer & Son (*CW Technology Newsletter, Jan. 28*).

Although closely related, the drugs are not identical. Lilly's, tagged BZ-55, is a sulfa drug; structurally, it's N-1-sulfanyl-N-2-n-butyl carbamide. Upjohn's product, Orinase, is 1-n-butyl, 3-(*p*-tolyl) sulfonyl urea.

The effort, of course, is potentially rewarding both to the drug industry and to the nation's 1 million diabetics. But even though results so far are extremely encouraging, it's still too early to make any sort of prediction, Lilly—a big supplier of insulin—makes it clear that you have to proceed slowly with any sulfa compound because of potential toxicity. Upjohn feels that toxicity should not be a problem with its entry. But it, too, points out that clinical tests cannot be hurried.

•

A patent issued to Dow Chemical last week (U.S. 2,734,915) underscores something that industry has suspected for some time: Dow has more than

an academic interest in acrylamide. Hitherto, Cyanamid has been the only name associated with commercial development of the chemical.

Also significant: the patent shows how Dow's ion-exclusion technique (*CW, Oct. 29, '55*) can be adapted to acrylamide production. Here's how it's done: acrylonitrile, water and sulfuric acid are reacted to form a mixture of acrylamide, acrylic acid, ammonium bisulfate, and sulfuric acid. This is fed to a water-immersed cation-exchange resin bed. The ion-exclusion principle permits the fractionation of the mixture into solutions rich in the major components.

Also underscoring a new interest is a talk to be delivered this week by Shell Chemical researchers before Technical Assn. of the Pulp and Paper Industry. They'll report a series of experiments relating brightness of pulp bleached with hydrogen peroxide to the aqueous concentration of the peroxide.

Significance: this is the first time that Shell personnel will have given a talk on hydrogen peroxide before a technical audience. Shell has already announced plans for a nonelectrolytic hydrogen peroxide plant at Norco, La. (*CW Technology Newsletter, Oct. 15, '55*), at least a portion of which will eventually be captive raw material for the company's new glycerine process.

•

Heyden will put its new pentaerythritol process to work in a 25-million-lbs./year plant at Fords, N.J. For the time being, Heyden is keeping quiet about the process, reveals only that it has been working on it for several years. Big feature: flexibility. The method reportedly can be used to turn out any one of many grades or types of penta.

•

Arizona State College (at Tampehas)—which lacks neither sunshine nor potential solar energy research projects—just installed the state's first solar furnace. Made by J. W. Flecker (Philadelphia) it has a reflector 5 ft. in diameter with a surface of 20 sq. ft. that's designed to focus temperatures as high as 3500 C on a spot ⅜ in. wide.

The furnace was actually purchased for the school by a nonprofit group (ASC) that extends financial aid to the college above and beyond that granted by the state legislature.

•

From now on, there will be less red tape in getting stable (nonradioactive) isotopes and rare earths produced by the Atomic Energy Commission. Under new streamlined procedures, neither domestic nor foreign applicants will have to make application with AEC prior to purchasing. They'll be able to deal directly with the producing facility. Also, electromagnetically concentrated stable isotopes can now be bought outright. (Previously they could be had only on a loan basis.) And it will be possible to get samples of rare and expensive isotopes on loan, if they can be returned undiluted and uncontaminated.

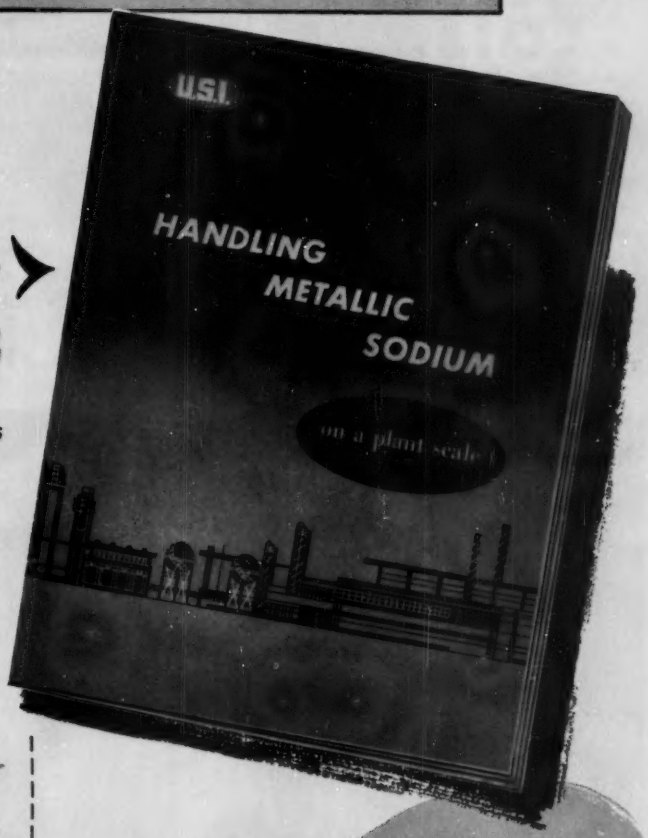
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A giant step in smog abatement will be taken by Southern California Edison Co. It's going to spend $250,000 this year for research and pilot-plant studies on equipment to control smog-producing compounds emanating from power-plant stacks. And it has budgeted another $1.5 million for more studies, should the first phase of the program indicate that they are warranted.

keeping up with **SODIUM**

Sodium handling in the plant

new book describes how

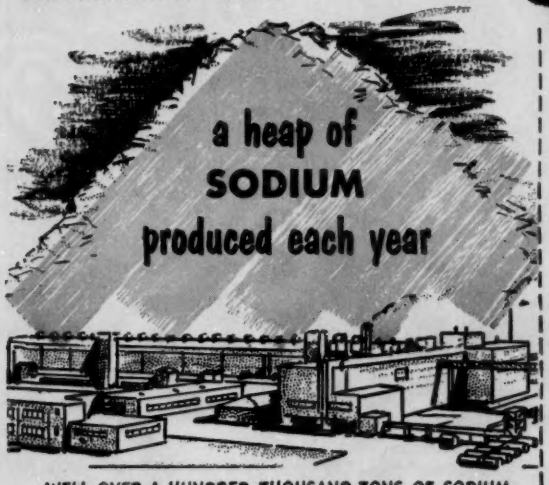


THIS BOOK IS FOR ENGINEERS AND PRODUCTION MEN WORKING IN DESIGN, DEVELOPMENT AND OPERATION OF SODIUM HANDLING EQUIPMENT.

CONTAINS INFORMATION SUCH AS–

- DETAILS OF TYPICAL SODIUM-USING PROCESSES
- DETAILS OF EQUIPMENT INSTALLATION, INSULATION, HEATING, REPAIR
- RECOMMENDATIONS FOR SODIUM PUMPING, METERING, INSTRUMENTATION
- SAFETY IN DESIGN AND OPERATION

FORTY–FOUR PAGES OF DETAILED INFORMATION ON SODIUM HANDLING BASED ON IN–PLANT EXPERIENCE. NO SUBSTITUTE FOR DIRECT U.S.I. TECHNICAL ASSISTANCE, THIS BOOK WILL NEVERTHELESS PROVIDE THE READER WITH A SOLID FOUNDATION IN THE PRINCIPLES AND PRACTICES OF SODIUM ENGINEERING. AVAILABLE FROM U.S.I. WITHOUT CHARGE.



WELL OVER A HUNDRED THOUSAND TONS OF SODIUM ARE USED IN THE UNITED STATES EVERY YEAR. 140 MILLION POUNDS GO INTO TETRAETHYL LEAD; ABOUT 45 MILLION INTO SODIUM CYANIDE; ALMOST AS MUCH INTO FATTY ALCOHOLS; 7 TO 10 MILLION INTO SODIUM PEROXIDE; ABOUT 4 MILLION INTO SODIUM HYDRIDE DESCALING OF STEEL; AND ABOUT 4 MILLION FOR INSECTICIDES, DYES, DRUGS, ALKOXIDE PREPARATION, SPECIALTY CHEMICALS, ATOMIC ENERGY AND A NUMBER OF MISCELLANEOUS USES. AND NOW TITANIUM METAL, "U.S.I. ISOSEBACIC" ACID AND MANY ORGANICS ARE JOINING THE LIST.

U.S.I. TECHNICAL SERVICE HAS BEEN CALLED ON BEFORE OR DURING DESIGN OF ALMOST EVERY NEW SODIUM HANDLING UNIT BUILT DURING THE PAST FEW YEARS. THE SAME SERVICE IS AVAILABLE TO YOU IN ALL PHASES OF YOUR DEVELOPMENT, DESIGN, AND PRODUCTION.

DID YOU KNOW



- THAT MILD STEEL IS SATISFACTORY FOR MOST SODIUM HANDLING EQUIPMENT?
- THAT SODIUM PIPELINES CAN BE CUT AND REWELDED WITHOUT DRAINING?
- THAT SODIUM BRICKS ARE MOLDED IN OPEN AIR?
- THAT MOLTEN SODIUM CAN BE PUMPED AND METERED CONTINUOUSLY?
- THAT THE ATOMIC ENERGY COMMISSION HAS STUDIED OVER 60 CONSTRUCTION MATERIALS FOR SODIUM HANDLING?

RESULTS OF THE A.E.C. STUDIES, ALONG WITH MANY OTHER DETAILS OF SODIUM HANDLING TECHNOLOGY, ARE PRESENTED IN U.S.I.'S NEW BOOK.

ASK FOR NEW U.S.I. SODIUM HANDLING BROCHURE.

U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation
99 Park Avenue, New York 16, N. Y.
Branches in principal cities

PERFORMANCE VERIFIED / by acid test

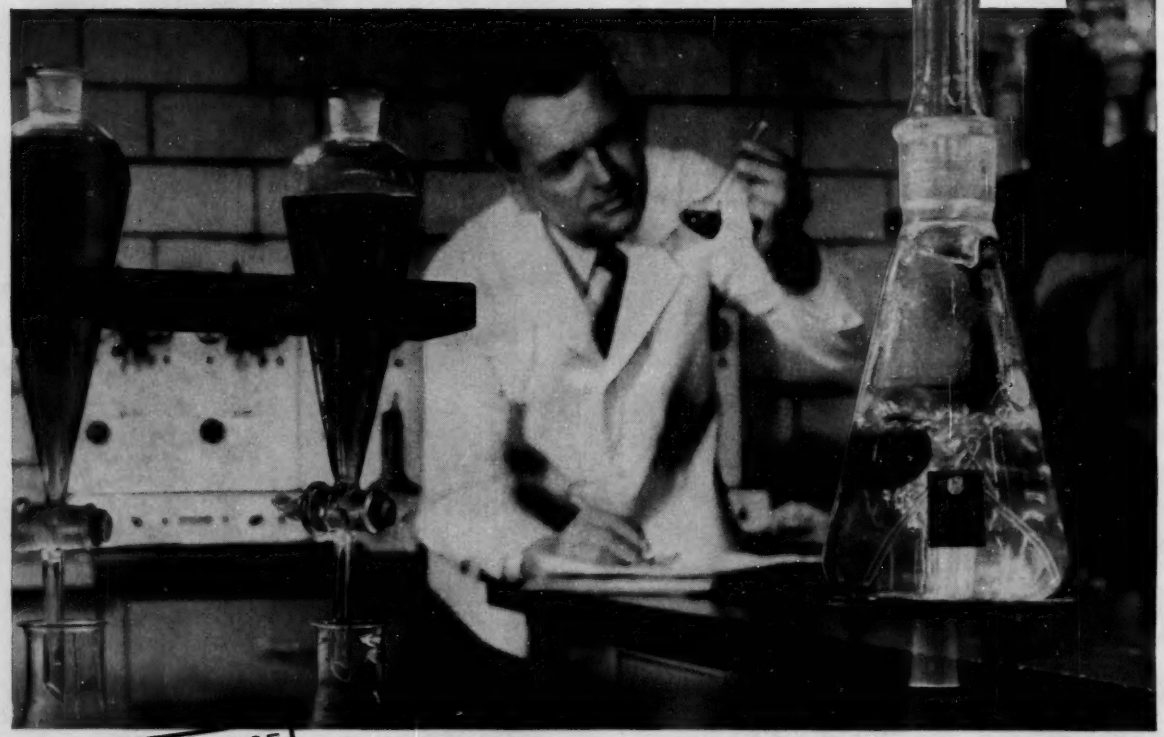
Even before a Powell Corrosion Resistant Valve is made, it must pass the acid test. For quality control begins with the very materials which go into Powell Valves.

Constant laboratory control is one of the many ways we make certain that Powell Corrosion Resistant Valves will give dependable flow control. Another is the final step of manufacture: *every Powell Valve is subjected to an actual line test.*

To keep pace with the rapidly expanding chemical and process industries, Powell has designed many new types of Corrosion Resistant Valves. The variety of pure metals and special alloys in which they are available has grown to such an extent that today there is a Powell Corrosion Resistant Valve to control the flow of almost every known, corrosive fluid.

Consult your Powell Valve distributor. If none is near you, we'll be pleased to tell you about our COMPLETE *quality line* which has PERFORMANCE VERIFIED.

The Wm. Powell Company, Cincinnati 22, Ohio . . . 110th YEAR



PERFORMANCE PV VERIFIED

FIG. 1503 SS (Sectional)—
150-Pound Alloy Steel Gate Valve.

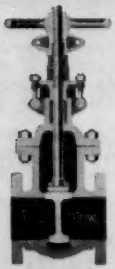


FIG. 3065 SS (Sectional)—
300-Pound Bolted Cap
Alloy Steel Horizontal
Lift Check Valve.

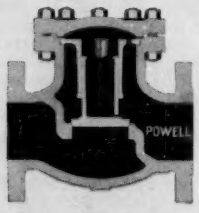
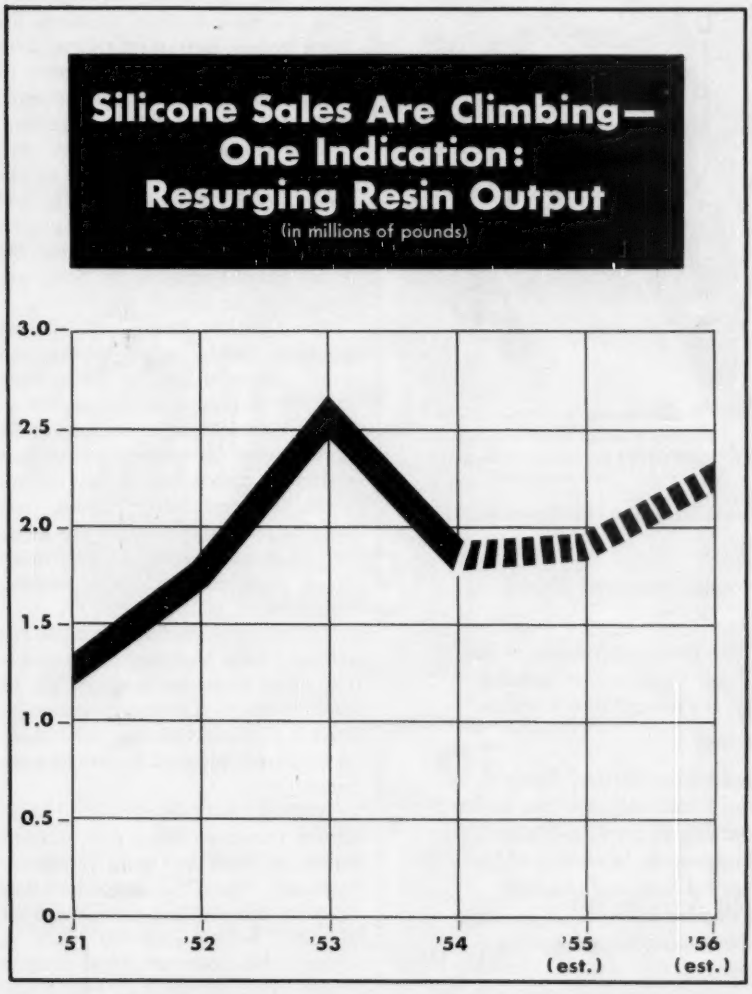


FIG. 1333 A (Sectional)—Integral Bonnet Angle Valve For Pressures of 1500 and 2500 W.S.P.



POWELL VALVES

BRONZE, IRON, STEEL AND CORROSION RESISTANT VALVES.



Silicones on the Ascent

Today, silicone products—more than 200 of them have been developed in just a decade—comprise an estimated $40-million/year business.

That statement in itself is not too astonishing—but this is: 10 years ago the war-bred and bustling silicone industry suddenly expired. Since then silicones have undergone a phenomenal rebirth. Fact is, so rapidly have they grown that one estimate envisions a near-$50-million/year business within the next couple of years.

The bulk of this fast-growing business has been cut two ways, between Dow Corning and General Electric. Exactly how large a share is now going to each is difficult to pin down, since spokesmen for both firms are reticent about revealing production figures; nonetheless, some approximations can be deduced from available sales data.

For example, Dow Corning estimates its '55 silicone gross sales at about $22 million. Since the firm reportedly satisfies 60% of the nation's current silicone needs, $37 million probably is a reasonable estimate of the industry's total '55 sales.

Assuming that GE now has about 35% of the business, and Union Carbide has the remaining 5% (figures with which representatives of the two companies have no serious argument), the respective 1955 dollar sales of these firms calculate to $12.9 million and $1.8 million.

Looking at the "guesstimates" in another way, Dow Corning's '55 production can be pegged at some 7 million lbs. if $3/lb. is taken as the average silicone price. Proportionately, GE and Carbide silicone outputs for '55 were 4 million and 0.6 million lbs., respectively.

Actually, there is no single large outlet on which to base demand estimates, no one silicone that characterizes the over-all production picture, no one manufacturing process that reflects accurately silicone plant capacities.

For these reasons producers usually prefer to relate production and capacity estimates to sales data; Dow Corning, for example, describes its silicone capacity as "$30-35 million/year worth of silicones."

Resin Ripple: The U.S. Tariff Commission does, however, report the annual silicone resin production (*see cut*). Striking is the fact that resin output reached an all-time high of 2.56 million lbs. in '53, then slumped to 1.85 million in '54.

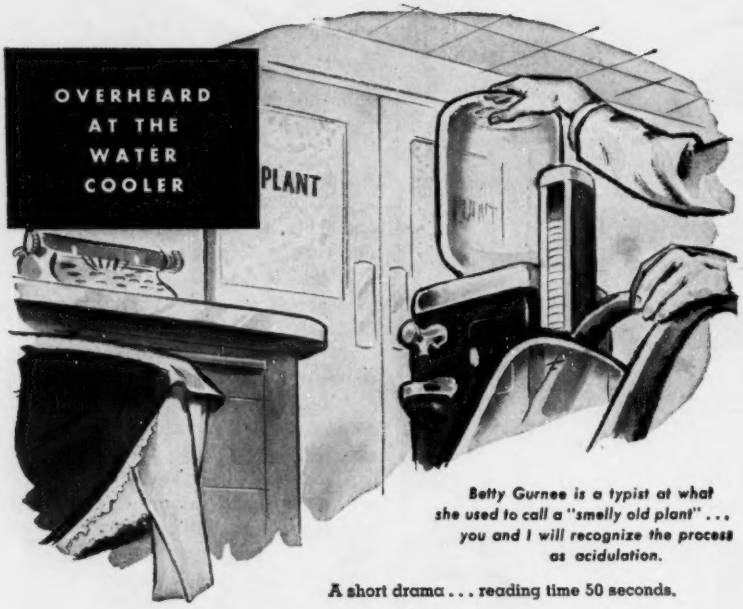
There were two reasons: 1) in '52 a mad scramble in the business resulted when the government overestimated its silicone requirements; 2) there was, nonetheless, a sizable consumption of resin for military purposes (e.g., silicone-varnish tapes for power cables), but a switchover to other material such as silicone rubber eliminated the outlet for resins.

In '55, after the slump, resin output again moved upward, reached an estimated 1.9 million lbs.; and further gains this year should push such resin production to at least 2.25 million lbs.

Orderly Expansion: Although silicone production is almost certain to climb steadily in the years ahead, the industry faces no immediate shortage of capacity; in fact, much of the current expansion activity is keyed to long-range planning.

The new installation of Union Carbide's recently formed Silicones Division (Long Reach, W. Va.) will be ready to go onstream by midyear.

Reflecting the firm's faith in a growing silicone market, the plant was expanded to the tune of an additional



Betty Gurnee is a typist at what she used to call a "smelly old plant" . . . you and I will recognize the process as acidulation.

A short drama . . . reading time 50 seconds.

He: "Got a bunch of camels around here now? I used to fill this bottle twice a week."

Betty: "Nobody, I repeat, *nobody* used to miss that water cooler on their way out of the plant. But, since we got the new doo-dad out there . . . why, it's *almost* like a bonus."

He: (*Exit, with bottle, muttering*)

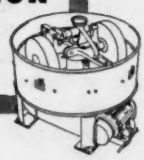
That "doo-dad" was a Simpson Mix-Muller. Betty's Boss had two reasons for buying it and only one had to do with personnel relations. He found that the Mix-Muller saved him the cost of ventilating one whole section of his plant. With it, he was able to control dust and noxious fumes from acidulation *at the mixing source* . . . because the Simpson Mix-Muller can be *readily* adapted for air exhaust or completely enclosed.

Control of dust and noxious or toxic fumes from dusty and dangerous processes is only one of the many adaptabilities of the Simpson Mix-Muller. It can be as easily adapted for heating, cooling or chemical reaction while mixing because it's designed and built to act as an integral *part of a process*. Some of these processes are described in our new "Handbook on Mulling". Write for your copy today and remember . . . mixing and the integration of mixing facilities is our *business* at National, it has been for over 40 years.





SIMPSON *MIX-MULLER*® DIVISION
NATIONAL ENGINEERING CO.
642 Machinery Hall Building
Chicago 6, Illinois



million dollars (total $15 million) while construction was still under way. Too, the basic facilities (services, fire lanes, boilers, instrument rooms) have been so laid out that quadrupling of the present capacity can be achieved without interrupting plant operation.

Dow Corning's new unit at Midland, Mich., is now ready to go on-stream (*CW, Feb. 4, p. 75*); and although GE reports no specific project under way, spokesmen aver that the firm's silicone capacity is being expanded "in an orderly way."

Four major classes of silicone products (fluids, resins, rubber, and water-repellents) account for at least 90% of all present silicone uses.

The electrical field—because of its growing need for temperature-resistant materials—stands out as the leading outlet. Silicone rubber, resins, and fluids in increasing amounts are going into the manufacturing of a wide variety of electrical items, e.g., motors, transformers, coils, cables.

Too, thermal stability has made the silicone family important in the manufacture of protective coatings. Yet to come are many silicone-plastic copolymers (e.g., silicone-alkyds), tailor-made to withstand intermediate temperature ranges.

Aircraft carry silicones in oil seals, hot-air ducts; textiles benefit through enhanced water and stain resistance, improved "hand"; release materials used in tire molding are almost all silicones; bakery pans are easier to clean if silicone-coated. More familiar outlets are cosmetics, hair sprays, furniture and automobile polishes.

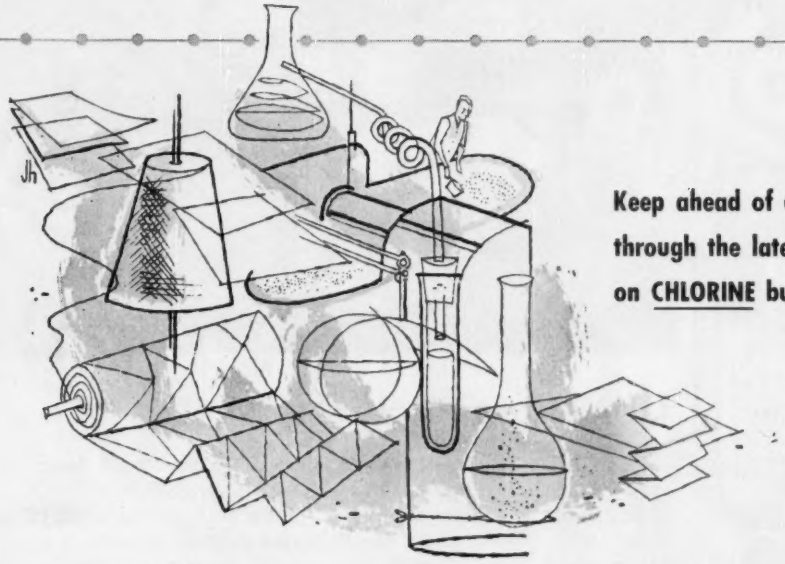
Up and coming are silicone uses in leather treatment to increase water-repellency without interfering with "breathing," and in the coating of bottles to minimize scratching and breakage during handling.

Even the pharmaceutical field may yet become a large outlet for silicones. For example, oft-reported adverse reactions to penicillin may possibly be due to the carrier, rather than the drug. Silicones, because of their chemical inertness, are good candidates for antibiotic carriers.

These—and perhaps many additional uses yet undeveloped—may, as trade experts predict, boost the hustling silicones business to a hefty $50-million/year level—and sooner than more conservative elements expect.

How Pennsalt helps **chlorine** users

plan for tomorrow



Keep ahead of competition through the latest word on CHLORINE buying and handling

All users of chlorine, large and small, can learn a lot, *be saved a lot*, for their tomorrows through Pennsalt's new free counseling service. How can Pennsalt help keep *you* ahead of the game?

. . . through guidance in purchasing

You may be able to cut chlorine costs considerably by changing grade, container, volume, or purchasing schedule. Pennsalt will help you decide what's best for you.

. . . through advice in handling and traffic

What's the safest, most economical method *for you* to handle chlorine and other heavy chemicals? How to unload, pump, etc.? Materials for tanks, pipes? Pennsalt has the answers for you—free.

GET SET FOR TOMORROW...NOW! Even if you "know all about" chlorine, Pennsalt has answers to questions you may not even think of asking. Call the nearest Pennsalt office or send the coupon—no obligation!

USERS OF CAUSTIC SODA, AMMONIA, HF: You too can best plan for tomorrow with Pennsalt's free guidance. Phone or use the coupon for full information.

Pennsalt Chemicals

INDUSTRIAL CHEMICALS DIVISION

PENNSYLVANIA SALT MANUFACTURING COMPANY

Three Penn Center Plaza, Philadelphia 2, Pa.

Appleton, Wis.—Regent 3-9307
Chicago 1, Ill.—Andover 3-6170
Cincinnati 2, Ohio—Main 1-3168
Cleveland 2, Ohio—Main 1-6205
Decatur, Ga.—Evergreen 5064
Detroit 26, Mich.—Woodward 1-8051
Paterson 1, N.J.—Lambert 5-3500
Philadelphia 2, Pa.—Locust 4-4700
Pittsburgh 19, Pa.—Atlantic 1-5233
St. Louis 1, Mo.—Central 1-2338
Tacoma 2, Wash.—Market 9101

Industrial Chemicals Division 252
Pennsylvania Salt Manufacturing Company
Three Penn Center Plaza, Philadelphia 2, Pennsylvania

Please send a representative to discuss with me our company's plans for tomorrow involving heavy industrial chemicals.

Name_____ Title_____

Company_____

Street Address_____

City_____ Zone_____ State_____

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EASIER
11 representatives throughout the country for convenient servicing.

QUICKER
4 plants strategically located for speedy delivery.

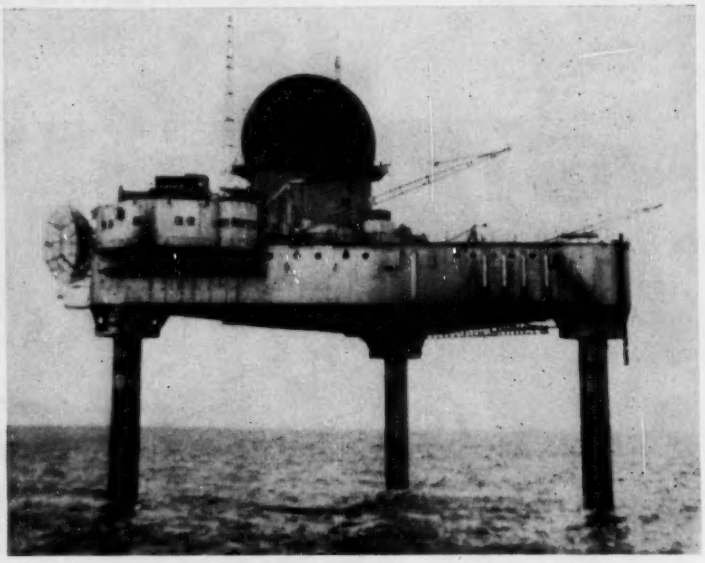
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Complete integration and quality control from tree to bag for dependable supply.

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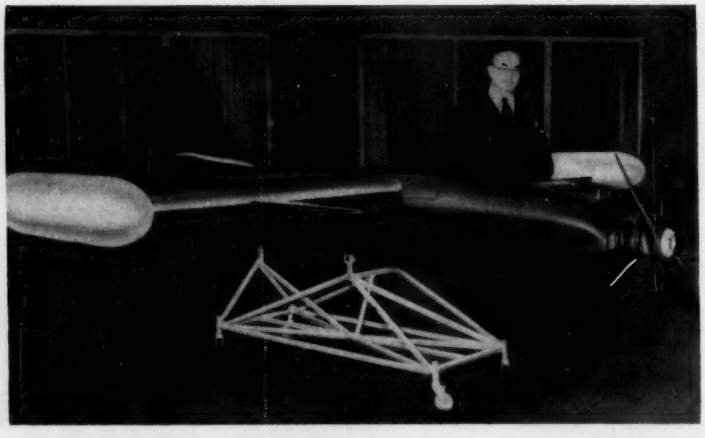


Ubiquitous Polyesters

PLASTICS' VERSATILITY is again dramatically underscored. Newest uses: as a dome atop the Texas Tower (*above*) radar island off Cape Cod, Mass.; as a construction material for radio-controlled target drones. Upcoming, too, is extensive use in guided missiles.

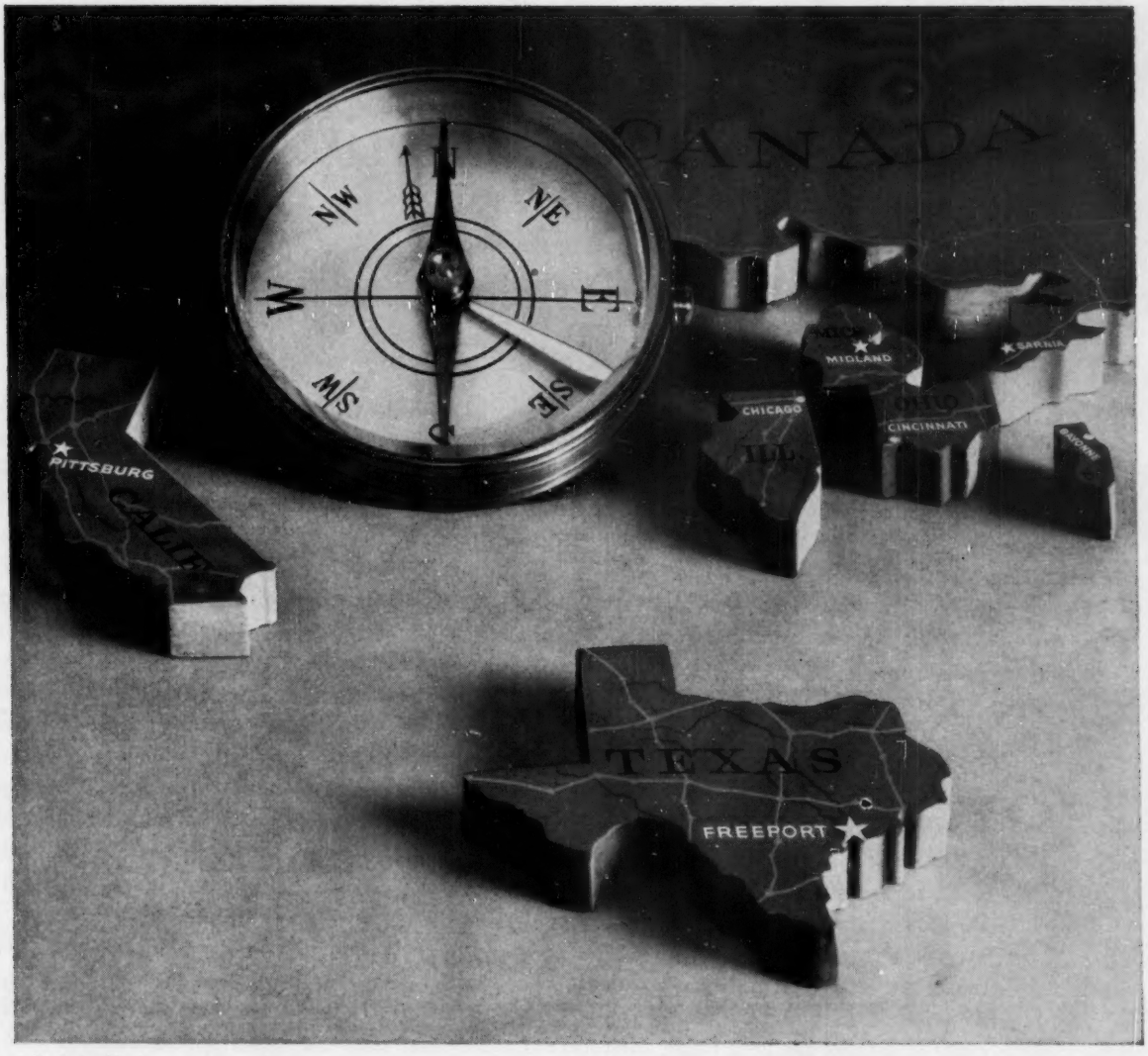
The Tower received, a couple of weeks ago, its first plastic dome, which houses radar antenna used in coastal defense. At about the same time Whitley Collins, president of Radioplane and Northrop Aircraft, was unveiling a new reinforced polyester-glass fiber multi-purpose medium-speed drone, the RP-77 (*below*).

Reinforced plastics is one of the fastest-growing segments of a fast-growing industry, and consumption of polyesters, the most widely used resins in this branch of the business, gives a fairly good indication of the big surge. Last year, for example, a near-50 million lbs. of polyester resins were used—some 80% more than '54's 27 million. And most resin market analysts will be suprised if use of the versatile polyesters doesn't hit close to 75 million lbs. by the end of '56.



fast, dependable delivery

DOW



★ Producing Plants
● Terminals

seven shipping points for

DOW HYDROCHLORIC ACID

Whatever the time, whatever the place—Dow operates an efficient service you'll appreciate! No broken promises, no irritating and costly delays. Dow has four producing plants and three additional distribution terminals that add up to seven reasons why you will receive your shipment promptly *when* and *where* you want it.

Order a specific concentration of Dow hydrochloric acid for your particular needs—it will be of the *very highest quality*. Order from the leading supplier of this important chemical. Contact the nearest sales office or THE DOW CHEMICAL COMPANY, Department IN 784U, Midland, Michigan.

you can depend on DOW CHEMICALS DOW

The Year Advertising Helped

IN 1954 we had a business recession in the United States. Sales fell about 4% during the year. If management had followed the historic pattern of business ups and downs, advertising volume would have fallen much further.

But in 1954 the volume of advertising did not fall. It increased over 5%. Every effort was made to stimulate sales when sales were needed to sustain prosperity.

This was something entirely new under the sun. It had a powerful influence in making the recession of 1953-54 one of the mildest on record. It helped greatly to speed business on to the record-breaking levels it has attained today.

There are several reasons why America's business management attacked this decline in sales with more advertising. One of them grew out of the greatly strengthened position of the American consuming market. Consumers' income after taxes has been rising an average of over $10 billion a year since 1946, and this rising income is more widely distributed than ever before. Furthermore, consumers have piled up reserves of about $215 billion in cash or its equivalent. These reserves offer a new and powerful inducement to increased selling and advertising effort even in the face of a possible decline in consumer income.

Taking the Longer View

However, the principal reason why a sales decline was attacked with increased advertising is management's new-found conviction that good advertising is essentially an investment in the development of a market. Successful development requires sustained investment. The inclination of business management to take this longer view, is, of course, motivated by the fact that the American market, with over 3 million consumers being added annually, is growing at a prodigious rate.

Ten years ago only a handful of companies had plans for investment in new producing facilities extending beyond the current year. Today almost all leading companies have investment programs running some years ahead. And keeping pace with these long-range business investment plans has been the development of sales and advertising programs to

McGraw-Hill
PUBLISHING COMPANY, INC.
330 West 42nd Street, New York 36, N. Y.



HEADQUARTERS FOR BUSINESS INFORMATION

Kill a Business Recession

reach tomorrow's greatly expanded markets.

This crucial role of advertising in providing driving power for our economy is gaining greater recognition every day. In his recent book, "People of Plenty," Professor David M. Potter of Yale University remarked: "Advertising is not badly needed in an economy of scarcity, because total demand is usually equal to or in excess of total supply, and every producer can normally sell as much as he produces. It is when potential supply outstrips demand—that is, when abundance prevails—that advertising begins to fulfill a really essential economic function."

Advertising's Key Role

Today abundance so completely prevails in the United States that it has been conservatively estimated that as much as a third of everything offered for sale falls in the realm of "optional consumption." That is, consumers can "take it or leave it" without any immediate personal inconvenience. But if they decide to "leave it," a terrific economic depression will not be far behind. In such circumstances, advertising—in which, in all of its forms, we are now investing about $9.2 billion annually—clearly is of crucial importance to our continued prosperity.

In performing its key role in past years, American advertising never realized its full potential. It successfully promoted sales. But it never was called upon to promote an overall economic stability as a direct outgrowth of increased sales.

By successfully promoting both sales and economic stability, as it did in 1954, advertising surely has added new strength to the American economy. It has also added a great new and constructive dimension to advertising itself. This accomplishment makes the celebration of our first National Advertising Week (February 19-25) a particularly notable occasion.

One of the surest means of expanding your sales volume in today's $150-billion *industrial* market is through dominant advertising in the publications directly serving your major customers and prospects.

McGraw-Hill's business and technical publications can give you quick access to the men who initiate, specify and approve the purchases of industrial products and services. Because all are leaders in their respective fields, you are assured a maximum return on your investment when you specify a McGraw-Hill publication to carry your advertising to your most important markets.



These two experts can help solve your methyl chloride and methylating problems

Our Messrs. Neuville and Zellner (left to right above) cover all the bases when it comes to methyl chloride application and the special field of methylation. They come by their particular specialties honestly. Since 1936 Ansul has been a constant and expanding source of supply for bulk methyl chloride in the domestic and export markets. In the field of methylation alone (Morrie Neuville's specialty) Ansul has successfully methylated more than 100 compounds.

The methylation laboratory at Ansul is equipped to take over a methylating problem of yours at any stage of development. Manufacturing facilities for producing commercial quantities of a methylated compound to your specification are also available.

As a major producer of methyl chloride, Ansul is prepared to supply you with quantities ranging from laboratory containers to cylinders of 100 pounds, 140 pounds, and 1,300 pounds. Tank cars of 40,000 pounds and 78,000 pounds are available. Delivery is prompt.

For general information about methyl chloride and its bulk application, write to Bob Zellner. Questions or just conversation relating to methylation should be addressed to Morrie Neuville. THE ANSUL CHEMICAL COMPANY, DEPT. C-12, MARINETTE, WISCONSIN.

ANSUL

Market

Newsletter

CHEMICAL WEEK

February 25, 1956

Most heated topic of discussion among phthalic anhydride market followers this week is a currently circulating Business & Defense Services Administration report on the plasticizer raw material.

Industry experts are scoring several points in the agency's survey and heaping particular criticism on its "conclusion" that there should be a further buildup in U. S. phthalic capacity because "there could be a shortage of productive facilities by 1957."

Most are convinced that capacity in place and definitely planned will be more than sufficient to cover all anticipated demand for at least four or five years. This, many say, was convincingly limned by Barrett's market research manager James Sayre at the recent CMRA coal chemical meeting in Pittsburgh.

Sayre, in general, confirmed *CW*'s earlier phthalic market study (*Sept. 3, '55, p. 71*), indicating that the curve of phthalic anhydride consumption—after a decided hop from a four-year-long plateau—could flatten dramatically again in '56. Although phthalic's domestic consumption would roughly parallel anticipated production, it would show no resemblance to climbing U. S. capacity, which, with similarly used isophthalic acid potential, will total more than 485 million lbs./year by the end of next year. Compare this with '55's domestic use of only 285 million.

In an exclusive telephone interview with *CW*, BDSA officials agree that upcoming consumption could lag well behind phthalic productive capability —pointed out that its facilities shortage comment is prefaced with a big "if." The qualification: "if demand for phthalic anhydride increases at the rate of growth recorded during 1955."

Market analysts noted the "if," of course, but insist that BDSA should have considered the historical hop-level-hop-level antics of phthalic production—which over a five-year period shows a moderate 41% increase—rather than emphasize an abnormal one-year ('54-'55) jump of 38%.

At any rate, chances are that although a number of petrochemical companies are now pondering the advisability of entering the phthalic anhydride arena (and this has current producers in a dither), few will do so without making a more searching market analysis than that provided by Washington.

•

Not nearly as controversial is the short- and long-range petrochemical production probability envisioned by M. W. Kellogg's Henry McGrath in Philadelphia last week.

This year, he predicts, petrochemical output may reach a near-35-billion-lb. level, while domestic production of all chemicals will approximate 127 billion.

Looking to the longer term, McGrath estimates that by 1960 chemicals derived from petroleum will hit 60 billion lbs. (33% of total chemical production), and by 1965 it will approach 125 billion, 50% of all chemicals.

•

Dicalcium phosphates are going to cost more. Monsanto, for one, has already posted new bulk prices on 18½% and 21% feed grades. The increases, effective immediately, peg the former at $83.25/ton, the latter at $94.50/ton. That figures out to a price of $4.50/unit of phosphorus.

Reason for the hike? One factor, says Monsanto, "increased costs of production all along the line."

Market Newsletter

(Continued)

Similar sounding is the explanation by Hercules Powder for a 2½¢/lb. advance in price of its technical-grade sodium carboxymethylcellulose. But customers won't feel the nudge until April 1. Tag then, for truckload lots, will read 39½¢/lb.

On the other hand, here's a price cut labeled plainly "an attempt to broaden markets." Carbide and other producers are lopping a hefty 20-22¢/lb. off anhydrous dimethylethanolamine schedules, but at the same time changing the basis from delivered to f.o.b. works.

The new rundown: $1.20/lb. (tank car); $1.22/lb. (c.l.); 1¢/lb. more in l.c.l. quantities.

•

In the market for calcium, potassium, or sodium propionate? There's more on the way. B. L. Lemke (Lodi, N.J.) has just completed a new manufacturing unit to turn out all three. Capacity of the installation: 500,000 lbs./year.

And propionaldehyde—with applications similar to acetaldehyde—is now available in tank-car quantities from Carbide's new Oxo unit at Texas City, Tex.

•

It's still too early in the season to pinpoint the upcoming demand for pesticides, but as of now the market is inactive. Manufacturers, however, dipping into an abundant supply of most raw materials, are going ahead with production schedules geared to "normal" consumer demand expectations.

On prices: some negotiating is still going on, but reports are circulating that a few DDT sellers are clipping as much as 4¢/lb. off the bug killer's old 27¢/lb. c.l. list tag.

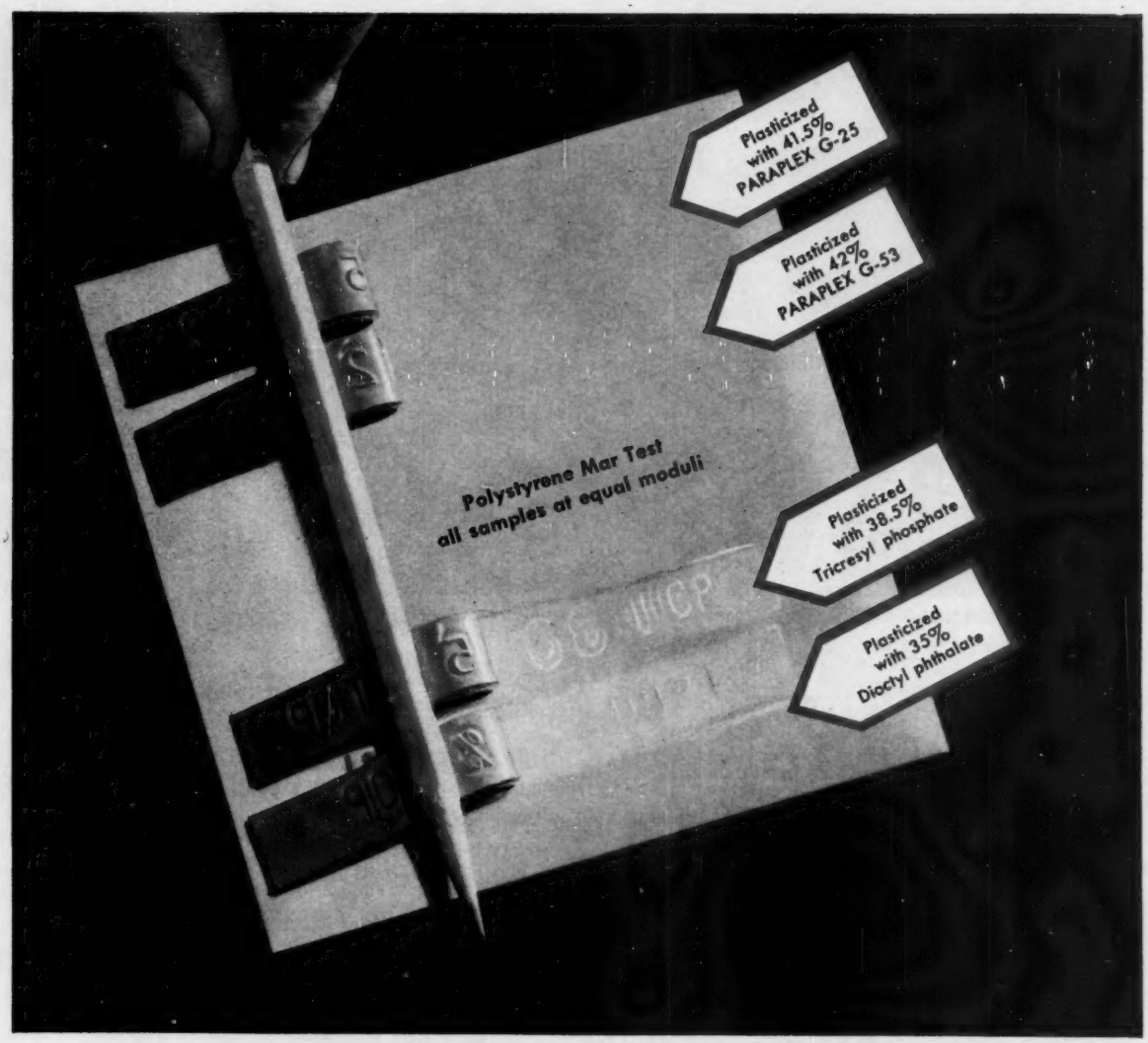
Silver salts are trending in the other direction—up. The hardening in bullion costs boosted silver nitrate prices, for example, twice in less than a week. Other silver salts affected: cyanide (now in a higher 83½-84¼¢/oz. range); chloride, 82⅞-83⅝¢/oz., depending on quantity.

Whether or not silver derivative prices will stabilize at the new quotes or inch higher is moot. But most salts customers may well be expecting further advances. Why? Bullion costs went up again over the weekend. Latest increase: ¼¢/oz.

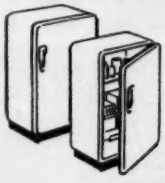
SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending February 20, 1956

	Change	New Price
UP		
Calcium phosphate, feed grade:		
18% P, bgs., c.l., t.l., frt. equald., ton	$ 9.25	$ 83.25
21% P, bgs., c.l., t.l., frt. equald., ton	10.50	94.50
Silver Cyanide, fib. dms., 2,500-oz. lots, oz.	0.01	0.8325
Silver nitrate, CP, cryst., bots., 2,500-oz. lots, oz.	0.01	0.5950
Candelilla wax, crude, bgs.	0.01	0.55
DOWN		
Cobalt acetate, 23.7%, bbls., dlvd.	0.10	1.20
Carbonate, 46% powd., bgs., dlvd.	0.30	1.85
Hydrate, 60-61% Co., dms., dlvd.	0.10	2.62
Sulfate cryst., 21% Co., dms., dlvd.	0.10	0.79
Thiamine hydrochloride, USP, regular or ampul-type, fib. dms., kilo	20.00	60.00

All prices per pound unless quantity is stated.



Cut down plasticizer migration with PARAPLEX G-53



The test illustrated here clearly shows why polymeric plasticizers such as PARAPLEX G-25 and PARAPLEX G-53 are recommended for use in vinyl compounds which contact polystyrene, lacquers, rubber, and baked finishes.

Take polystyrene for example. Widely used in refrigerators and other appliances, polystyrene is often severely marred by vinyl gaskets containing so-called fugitive plasticizers. When PARAPLEX G-25 or PARAPLEX G-53 is used, migration is drastically reduced and the appearance and physical properties of the polystyrene are virtually unaltered.

PARAPLEX plasticizers provide many other benefits, too. PARAPLEX G-53 is highly resistant to extraction by soaps, detergents, and hydrocarbons. It is extremely non-volatile. And its cost is quite moderate. High molecular-weight PARAPLEX G-25 has all of the physical properties of PARAPLEX G-53—and more.

For more information on *all* of the plasticizers produced by Rohm & Haas Company, ask for *What You Should Know About* PARAPLEX *and* MONOPLEX *Plasticizers.*

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THE RESINOUS PRODUCTS DIVISION

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KELLOGG MANAGEMENT*: Now emphasizing goods as well as services, they're . . .

Builders Turned Makers

M. W. Kellogg—which made its big name in engineering—is boosting its stake in plastics manufacture by pushing ahead with plans to make low-pressure polyethylene.

It's all part of an effort to strike a balance between the two activities, smooth out the construction business curves.

Here's what the company now gives to and gets from the chemical field:

They take their engineering seriously at M. W. Kellogg. And they'll be applying the same earnestness to the new business of producing polyethylene (*CW Technology Newsletter, Feb. 14*) via the Phillips low-pressure, catalytic process.

When and Where? There are still plenty of unanswered questions about Kellogg's plans in the field, largely because its market evaluation program is not yet complete. For instance, the firm has not decided whether it will pilot the process prior to putting up a full-scale plant. Nor has it selected a site for the plant or decided the scale of operations.

But, it's not too hard to get an idea of what some of the answers will be. The firm says, for example, that production is a minimum of 1½-2 years off. That provides an ideal opportunity to pilot-plant, and it's likely that Kellogg will conduct at least a modest program by converting one of its many Jersey City pilot units to polyolefins.

Similarly, it says that the exact site has not been firmed up. But it has zeroed in on the general area.

• *(CW's bet: Texas).*

And as for size, it says only that the plant will be somewhere in the range of already announced commercial, low-pressure polyethylene plants—25 million lbs. (Hercules) to 110 million lbs. (Phillips).

• *(CW's bet: 25 million lbs.)*

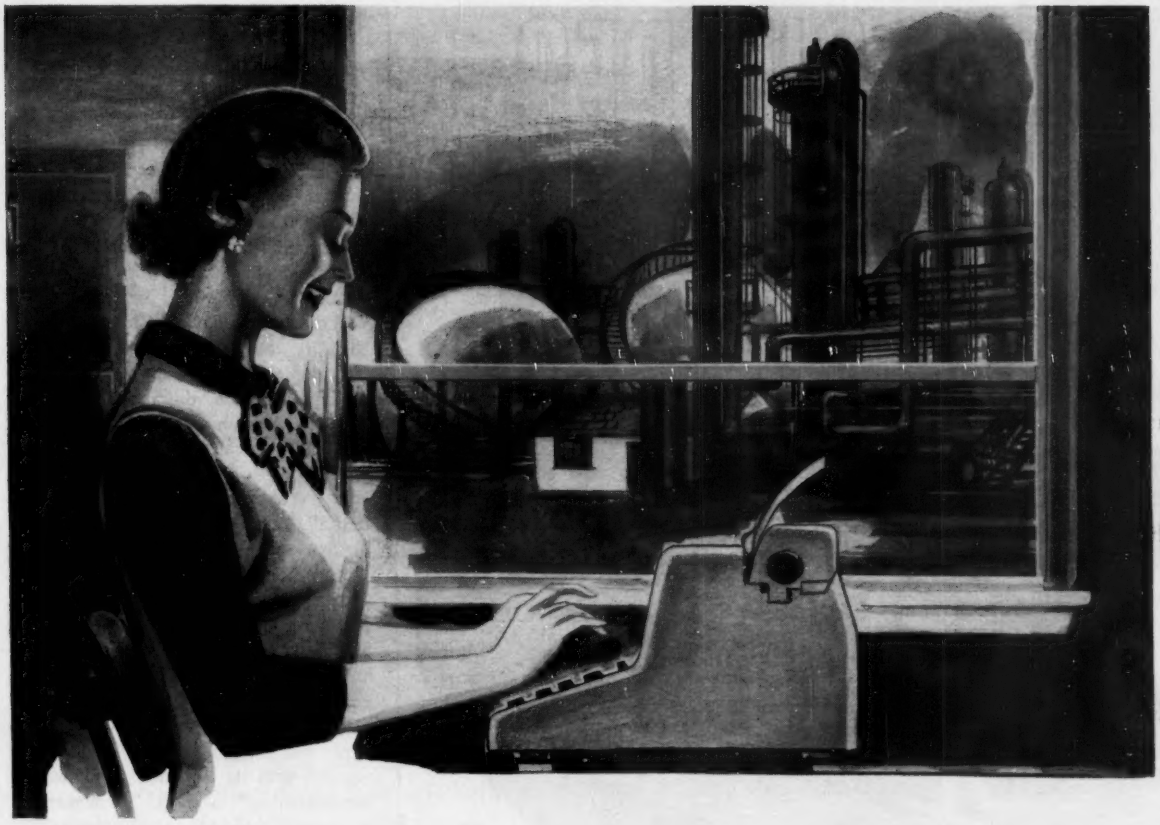
Whatever the scale of operation, Kellogg's decision to become a producer looks—at first glance—like an easy way for a construction company to lose its shirt. For it's entering a field that some feel is already crowded. And to make matters worse, the crowd is made up of some of Kellogg's best customers.

On the other hand, Kellogg is already a plastics producer by virtue of its Kel-F facilities. And, although most chemical men look on it as an engi-



JERSEY CITY FACILITIES: Coming, a mate for the plastic 'platinum.'

*Left to right: Vice-President-research-director Hanford; President Smith; Vice-President-patent-attorney Leibrecht.



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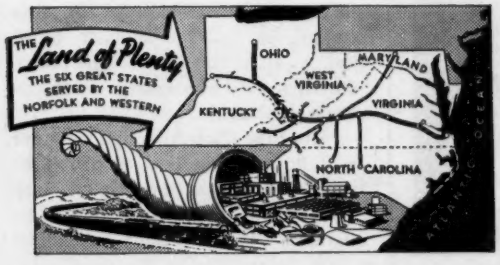
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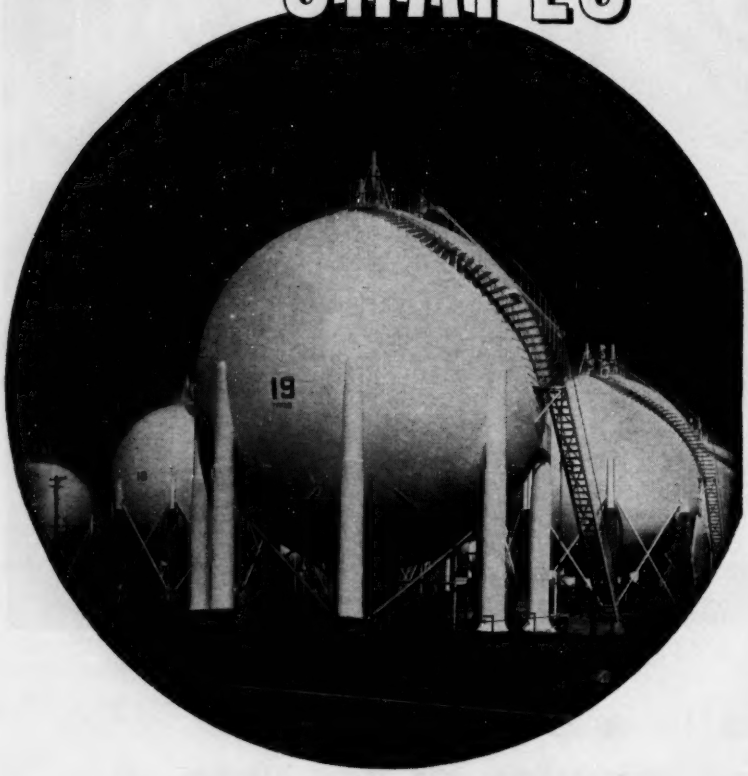
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neering firm, the molders know it as a resin maker. In this case, they're the ones who count.

Says William (Butch) Hanford, its enthusiastic, articulate vice-president and director of research: "We think of Kel-F as the plastic platinum. Now we're going after polyolefins, the plastic equivalents of iron."

As far as the field being crowded is concerned, Kellogg freely admits that its interests go beyond simple polyethylene. The linear product of the Phillips process differs significantly from the branched product of the Imperial Chemical Industries high-pressure process.

In between, there's a gamut of potentially commercial products that can be made by copolymerizing ethylene with other olefins (e.g., propylene). Extending the analogy, these copolymers are alloys, and Kellogg feels that with its savvy in process developments and its know-how in building, it is a natural to exploit them.

Nor does Hanford believe its move will put Kellogg in direct competition with its customers. "Consider our activities," he says, "as segments of a rod. Polyolefin manufacture is just a logical extension of that rod. But remember, it's a rigid, inflexible rod, and our engineering and production operations will be as far apart as the two ends."

Peaks and Valleys: Kellogg has been seeking the right extension of the rod for some time. One reason: the construction industry is notorious for its economic peaks and valleys. It's impossible to flatten these out completely, but the management feels that solid production operations will help.

Also, it says that plant ownership will help elevate its status in the eyes of young engineers, make its recruiting job easier. Finally, it hopes that by shoring up its operations staff, it will get creative cross-fertilization between design and operating engineers, which will be beneficial to both.

But finding the right product was no easy task. Obviously the firm couldn't go into the fields it knows best. As Hanford puts it: "The probability that we'd ever emerge as an ammonia producer is zero."

Part of the Plan: Although the move by Kellogg caught a lot of people by surprise, a look at the firm's history shows that it fits a pattern: it became interested in producing chemicals



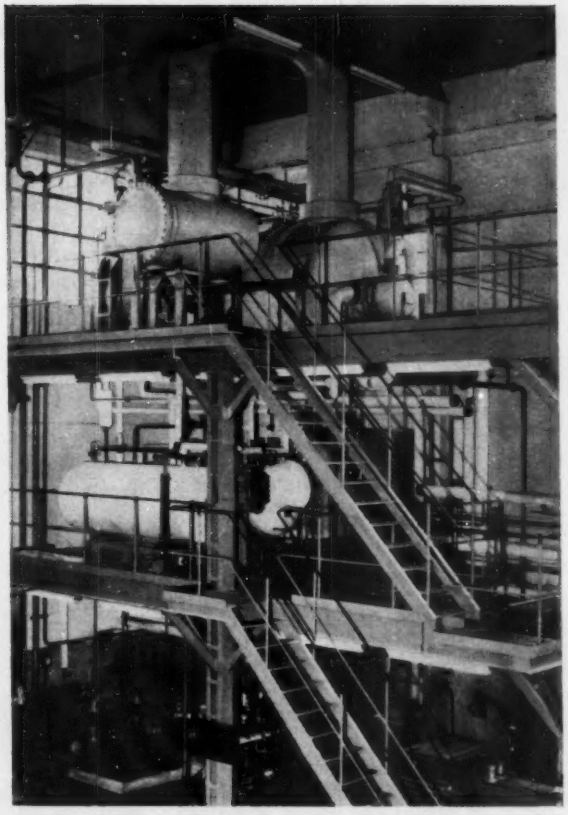
IN MONTEVIDEO...

another FW plant for low-cost distillation of

fatty acid

NEWEST ADDITION to the World Roundup of FW fatty acid processing units—the distillation plant shown here was built for Compania BAO, Montevideo, Uruguay. Designed and engineered by Foster Wheeler, this plant has a rated capacity of 1500 lb per hour of crude fatty acid.

Large plants or small—for continuous or batch processing—Foster Wheeler's long experience in fat splitting, fatty acid distillation and fractionation, esterification, hydrogenation and derivative production can contribute much to the *dependable* and *economical* operation of any installation. We will be glad to demonstrate the advantages of this FW "know how" by quoting on your immediate or future requirements. *Foster Wheeler Corporation, 165 Broadway, New York 6, N. Y.*



Interior of Compania BAO fatty acid distillation plant, showing still and main condenser on upper level and product receiver directly below. This FW-designed plant processes 1500 lb of crude fatty acid per hour.

FOSTER WHEELER

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when it started making cracking catalysts. And as long ago as 1942, Morris Kellogg, the founder, decided there should be more of a balance between the operating and producing ends of the business.

Because of the war, nothing could be done until 1945 when the company took up fluorocarbons. Its decision to make polyolefins is part of the same plan, as is a project (still being considered) to extract wax from fir bark on a commercial scale *(CW Technology Newsletter, Jan 21)*.

A Deal: Kellogg started his business (in 1905) in pipe fabrication, chimney stacks manufacture, and welded pressure vessels. One day in 1919, Richard Fleming, a young inventor starting out on some experiments, approached Kellogg to price his welded pressure vessels.

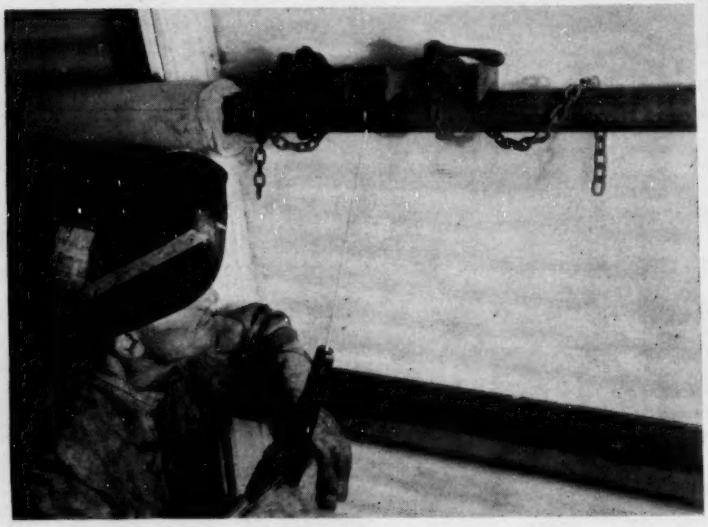
The latter's rejoinder—"Let me see your data, and I'll give you the vessel"—was the start of an engineering business destined to become one of the world's leading builders of refineries and chemical plants.

Some of the technological milestones along the way were the development of the Cross process, one of the early thermal cracking methods, and the combination unit, which permitted continuous flow of materials in the refinery. Probably its biggest claim to refinery fame is the key role the company played in the commercialization of fluid-bed process.

In 1942, it was assigned the task of designing the K-25 gaseous diffusion plant at Oak Ridge. It formed Kellex (now inactive), and, with the help of some of the top engineering and scientific brains in the country, scaled up a little-known test-tube process to a $500-million plant. The process was in and running five weeks ahead of what many considered an impossible schedule.

A financial milestone was the sale of the company to Pullman Inc., in '44.

At that time, Kellogg was looking for a buyer so that a value would be placed on the property for estate purposes. His requirements: the buyer must be wealthy and willing to let the company run without interference. Just about then, Pullman had been ordered to divest itself of its sleeping car holdings and had hard cash burning a hole in its corporate coffers. The sale was happily consummated for $18.25 million.

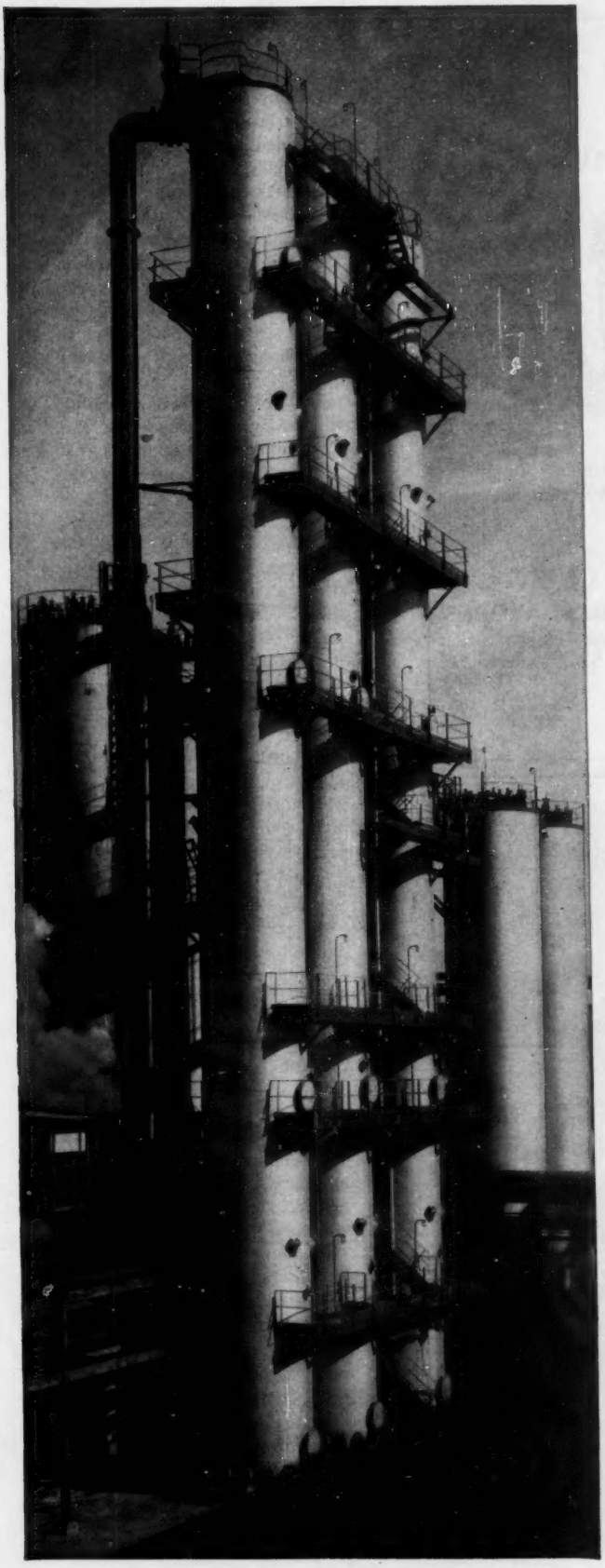


Careful—Sodium in That Pipe

CUTTING AND WELDING a pipeline full of metallic sodium sounds as if it would be a hazardous operation. But the job can be done safely. The trick is to first freeze the molten sodium, by cooling with air (*below*), to plug the line before cutting. Next, the pipe is sawed, and sodium is scraped from at least 4 in. of each open end. The new section is then firmly clamped into place and butt-welded (*above*).

This technique is suggested by U. S. Industrial Chemicals (New York) in its latest edition of "Handling Metallic Sodium." By charts and tables, the booklet summarizes data gleaned from latest developments in sodium processing. Also contained: details of typical processes, equipment installation, instrumentation; resistance of materials of construction; recommendations for safety in design, operation, and maintenance of systems using sodium.





GRAVER

Gas and Chemical "scrubbers" for Great Lakes Steel

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At Great Lakes Steel Corporation's Blast Furnace Division, a new by-product coke plant is equipped with a total of 25 large examples of Graver's craftsmanship in steel.

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This variety of quality fabrication indicates Graver's versatile craftsmanship—demonstrates Graver's ability to shop-fabricate and field-erect structures for the steel, petroleum and chemical industries. For process and storage equipment in steels, alloys or clads, Graver's offices across the country are staffed with competent engineers ready to serve you.

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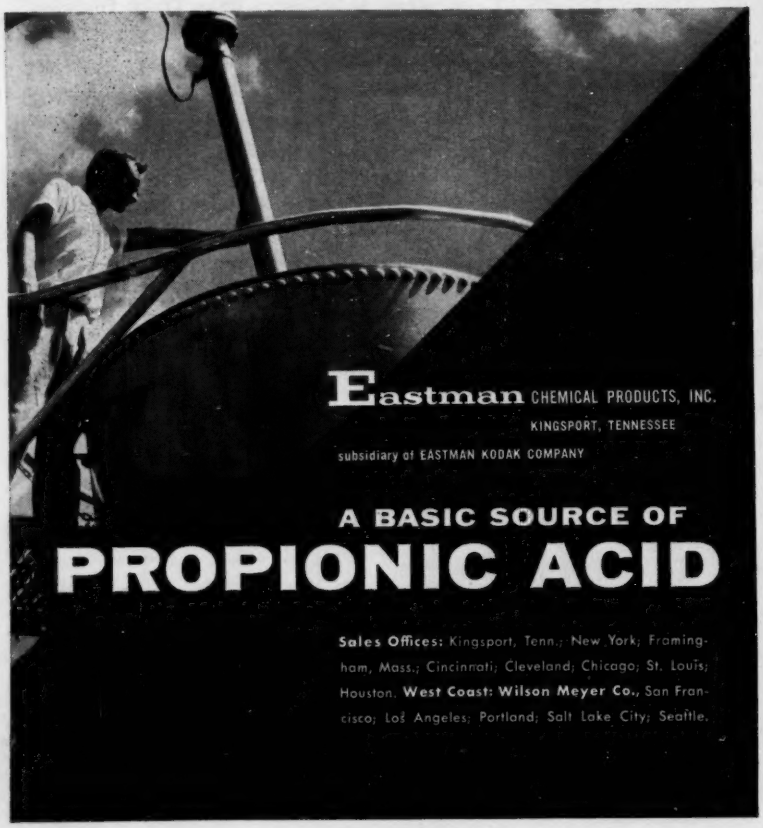
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PRODUCTION. . . . .

Measuring Up: Figures on Kellogg have never been published. But Pullman sales for nine months last year amounted to $236 million. Nonrailroad billings are thought (by Wall-Streeters) to account for half of the gross revenues. That would probably put Kellogg's nine-months billings in the neighborhood of $80 million.

But billings in the construction industry vary tremendously. More meaningful are the earnings. And for the same nine months of last year, Pullman earnings have been pegged at $6.36 million. Kellogg is believed to contribute about 40% of the earnings. That would put it at $2.6 million for nine months or at a rate of $3.4 million/year.

Only One Fair-Size Job: The fluorocarbon and polyolefin business won't add up to a very big portion of the firm's business. Look at it this way: the Kel-F plant was designed for 1 million lbs./year, now turns out a product that sells for $9/lb. on the average. The polyolefin operation will probably be of the same order of magnitude volume, in terms of dollars. That will put Kellogg's chemical business at not more than $20 million/year. In the construction industry, this would mean only one fair-size job.

What it will do is give the firm balance. That at least is the hope of its young management—President Warren Smith, Vice-Presidents Hanford and Frank Liebrecht, the lawyer-engineer who made the licensing arrangement with Phillips. They're not putting less emphasis on service, only more on "goods."

Ions Fill Atomic Larder

As atomic power and other budding nuclear industries move nearer to reality, they're digging ever deeper into the world's uranium supply barrel. That they haven't yet scraped bottom is due—in part, at least—to ion exchange's workmanlike job (*CW, Jan. 14, p. 58*) **in recovering the fissionable metal from medium- and low-grade ores. Now onstream in Australia's recently completed Port Pirie separation plant, ion exchange is turning the trick with hard-to-treat ores from nearby Radium Hill.**

Carrying uranium as a highly refractory mineral (davidite), Radium Hill concentrates pose some tricky

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National Carbide

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P 8943 Chemical Week
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P9218 Chemical Week
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Position Wanted

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Sales Manager—Satisfied with fabulous Delaware Valley sales? Perhaps fifteen years experience process plants—equipment—sales can provide necessary spark. SA-9337, Chemical Week.

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processing problems. Like most other uranium ores, they're unsuited to metallurgical treatment, require a cycle of leaching, separation and purification.

The process employed at Port Pirie starts with acid leaching of the ore. A water slurry of Radium Hill concentrates (60% solids) is mixed with sulfuric acid in five of the plant's six digestors. Each batch is agitated at boiling temperature for 10 hours, during which time 15-20% of the ore is dissolved.

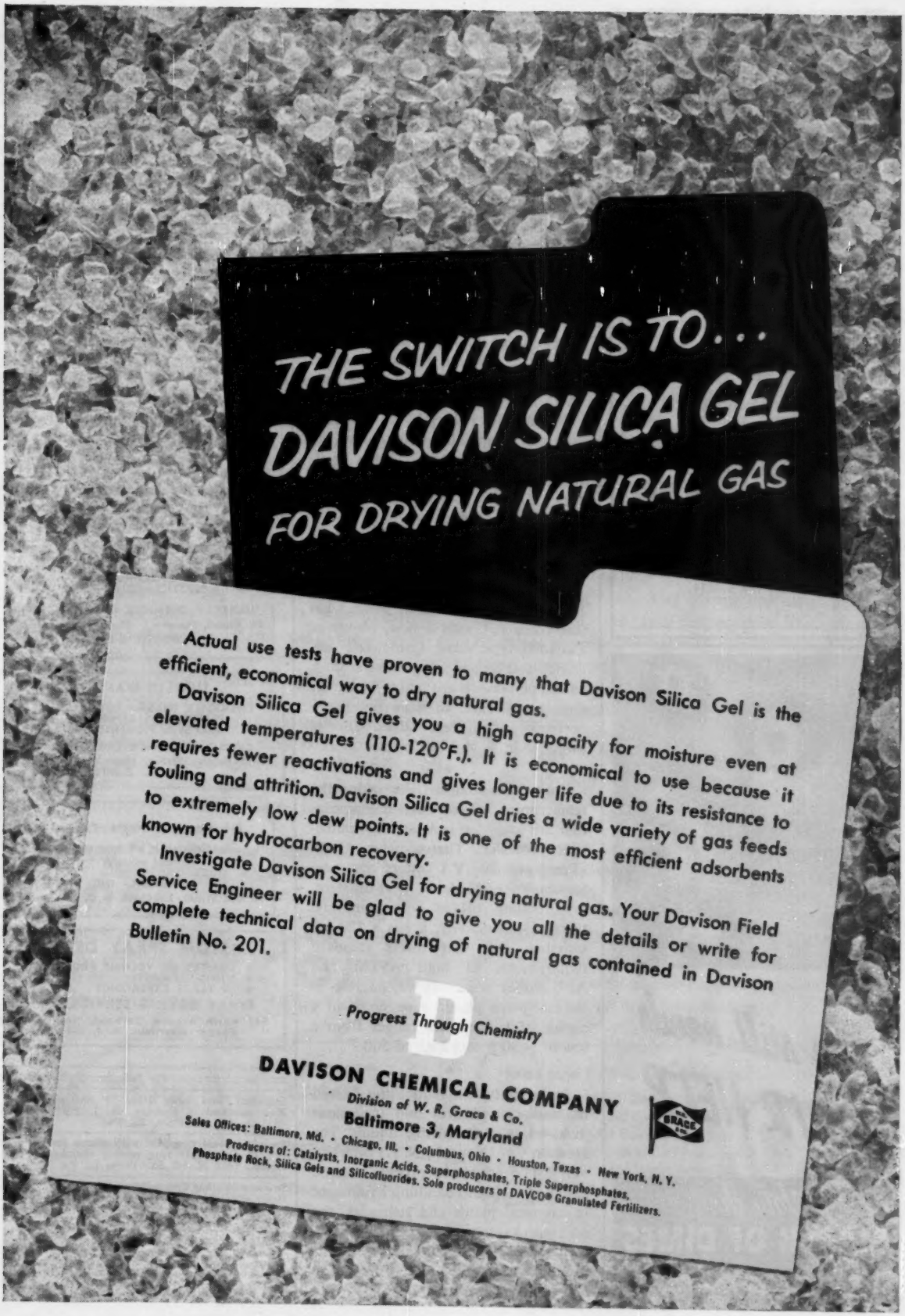
Leached pulp is discharged to holding tanks, mixed with recycled liquor from other sections of the plant. After leaching has dropped sulfuric acid content from 40% to between 2-5%, a slurry of lime is added to neutralize remaining acid and condition the liquor for subsequent processing. The pulp is then discharged to a series of three thickeners, which recover uranium-bearing liquor from the spent ore by countercurrent decantation.

Three-at-a-Time: In the extraction section of the plant, cloudy pregnant liquor is first filtered to remove all solid particles. The clarified solution then passes to two ion-exchange units, each consisting of four 12-ft.-high, 7-ft.-diameter, rubber-lined columns packed with synthetic resin beads. Three columns are used at a time, the liquor flowing from the bottom of one to the top of the next and finally discharging to waste from the bottom of the third.

Adsorbed uranium ions are stripped from the resin by a solution of sodium chloride and sulfuric acid. This operation is carried on continuously by a switching arrangement that cuts a freshly regenerated column into the third position of the cycle as the first column is disconnected for elution.

Eluate containing uranium values flows continuously through a three-stage cascade-type precipitation unit, is mixed with lime to reduce acidity and precipitate iron. The resulting iron hydroxide is concentrated, filtered out of the solution, and returned as a slurry to the leaching plant for recovery of entrained uranium.

Overflow from the iron thickener, together with the filtered liquor, passes to a second three-stage cascade precipitator where uranium is dropped out by the addition of magnesia slurry. After a final thickening operation, the heavy pulp of uranium salt is purified


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The moist filter cake is extruded in small rods onto a stainless steel belt, which conveys it through a tunnel dryer at 500 F. The dried yellow uranium salt falls into a storage hopper, is later packaged and shipped in 44-gal. drums.

Automatic Control: Like most modern chemical plants, the Port Pirie separation plant is completely instrumented to maintain close control of the critical processing steps. This type of control enables the plant to handle 10 tons of Radium Hill concentrates per 10-hour leach batch with only 16-18 men per shift.

A natural for the job, ion exchange is readily adaptable to continuous operation. With this, in addition to its other unique capabilities, it's certain to play a major supporting role in future uranium production.

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Self-Centering Valve: Chas. Saucier & Son, Inc. (Minneapolis, Minn.) has just come out with a new, improved Canadian-type valve. Completely machined and lapped for positive sealing, valve components are said to be harder and more dense, to have fewer imperfections than cast valves. They're available in 4- to 14-in. sizes.

•

Tank Thermometer: For taking the temperature of corrosive compounds that are tough on ordinary thermometers, Weksler Thermometer Corp. (Freeport, N. Y.) offers its new Scoopmaster. Made of heat-resistant, nonsparkling plastic with minimum thermal conductivity, it has a 120-ml. sampling cup that meets standard requirements of both ASTM and API. Tubes are easily replaceable in the one-piece plastic case, come in a choice of temperature ranges from a low of —30 F to a high of 500 F.

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Fuel Safety: To reduce the hazard of static-caused fires and explosions in handling of flammable liquids, The Hewson Co. (Newark, N. J.) offers its new MG-5 automatic process control. Installed on liquid handling equipment in chemical plants and refineries, the unit checks grounds and/or bonding connections, automatically prevents liquid transfer operations if protection is unsatisfactory.

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12-15 P.H.R. increase tensile strength of butyl wire and cable compounds, give good stiffening effect, good electrical properties; low loadings reinforce butyl-compounded bicycle tubes and tires and, in all butyl compounds, reduce "nerve" of the "green" stock and give faster extrusion with minimum die swell, extremely good weatherability, ozone resistance, insulation resistance, and corona resistance.

2% by weight Cab-o-sil stops drainage in polyester and epoxy glass reinforced laminates — it is easily brushed, sprayed, or squeegeed and reduces orange peel in gel coatings; 1% increases viscosity in non-thixotropic polyester resins from 410 centipoises (Brookfield viscosity) to 8,000 centipoises at 2 r.p.m. and 3,500 centipoises at 20 r.p.m.; 2% produces more uniform plastics coatings.

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2% Cab-o-sil effectively suspends heavy inert pigments in resins; is easily and quickly dispersed by a propeller type mixer for uniform resin distribution; improves "can stability" of paints, retarding the settling of high density prime pigments, and imparting thixotropy and flow control.

2% Cab-o-sil is colorless in resins, thickens without affecting the wetting characteristics, appearance, or application properties of the resin; small quantities keep polyester and epoxy glass resins transparent.

A 4% Cab-o-sil AD aquasol, used as a precoating dispersion in a single step coating operation, produces cleaner white lines and deeper blue background in blueprint paper, more sharply defined colored lines in direct process paper.

0.4% produces a free-flowing sulphur; small percentages impart excellent anti-slip properties and higher film gloss to solvent base floor waxes, give better body and anti-slip properties to inks, act as wetting agents and emulsion stabilizers in latex rubber goods, and aid color development in butyl rubber weatherstripping and bicycle tubes and tires.

These are but some of the examples of how Cab-o-sil is being used industrially by more than 500 companies to improve various products and processes. In each case, the application of Cab-o-sil has proved superior to previously acceptable materials because of its unique combination of properties. Send today for your sample of Cab-o-sil and investigate the possibilities for improving your product manufacture.

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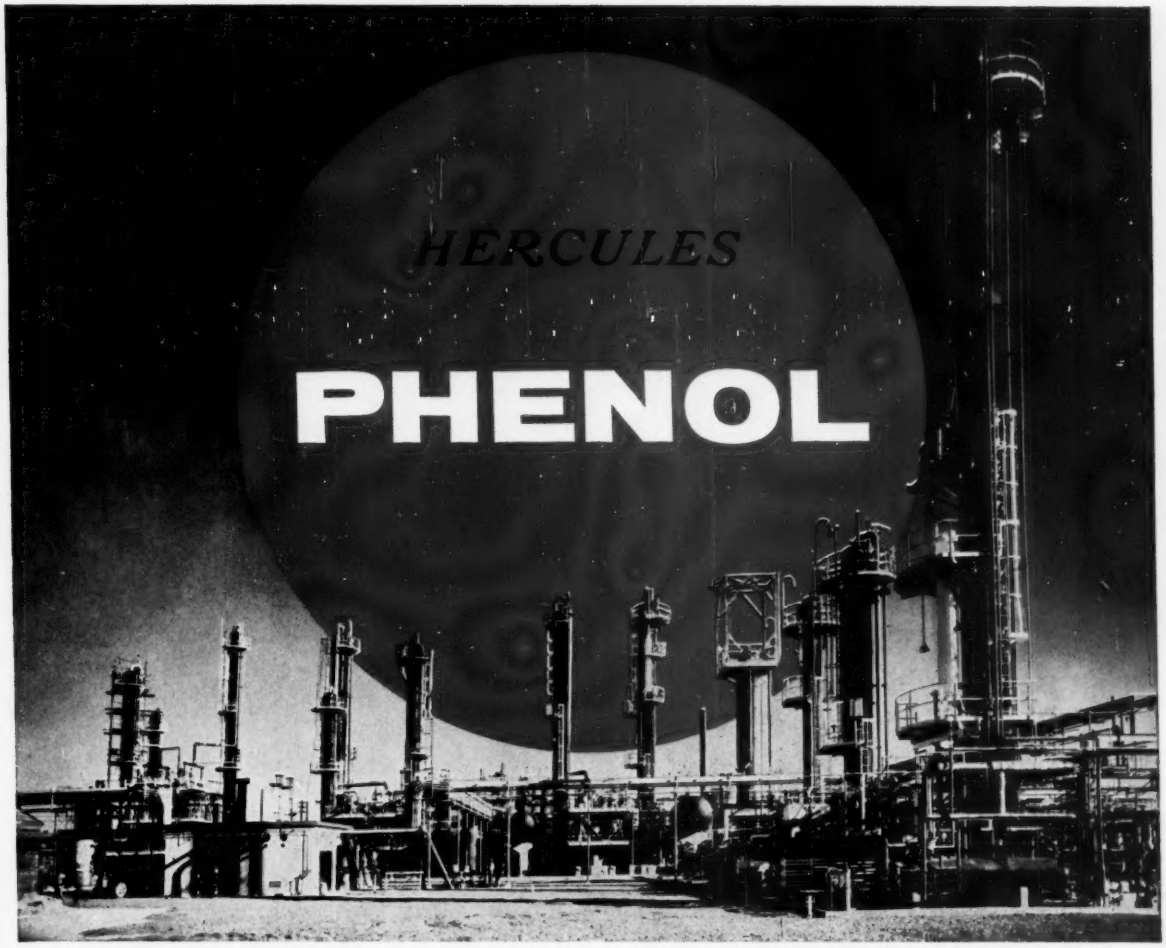
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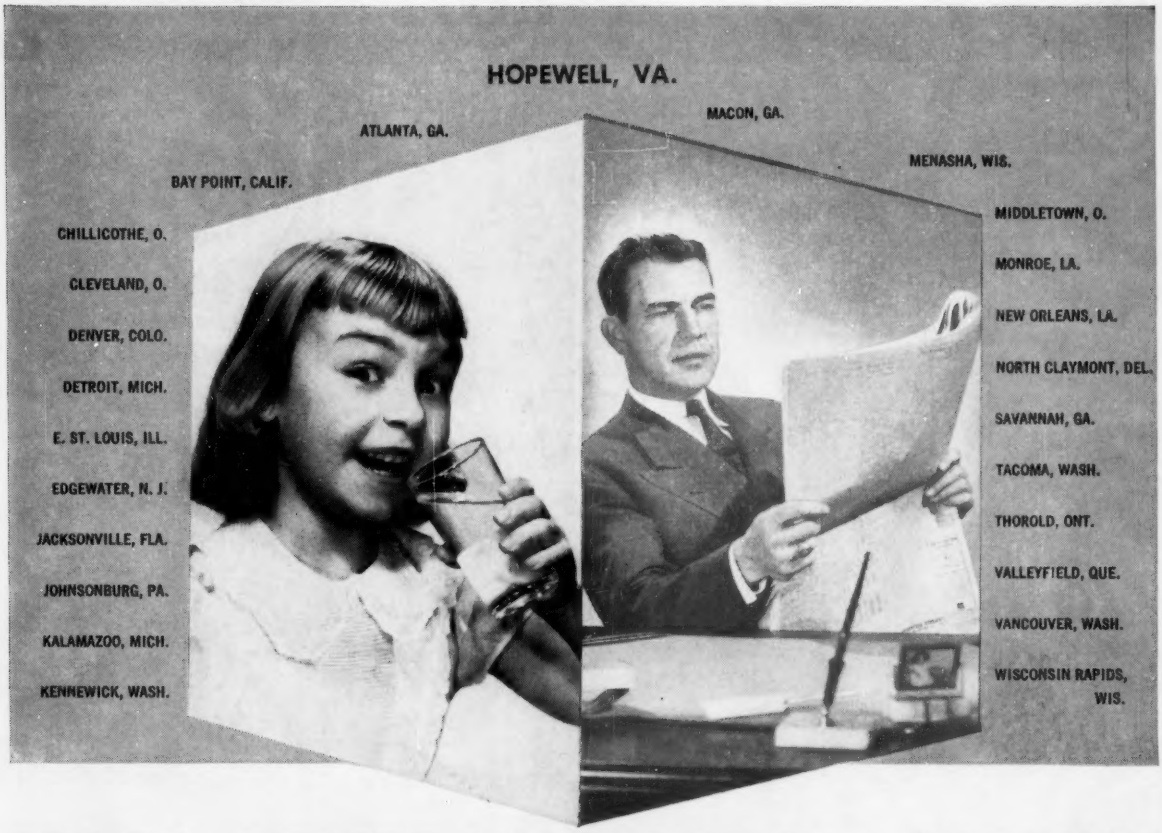
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